EDUCATION, RESEARCH, INFORMATION SYSTEMS AND THE NORTH

Editor

W. Peter Adams

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DEDICATION IN THE WORKING LANGUAGES OF THE ASSEMBLY OF THE NORTHWEST TERRITORIES

This book is dedicated to the people of the Northwest Territories who were hosts of the meeting, in April 1986, which produced it. We are grateful for the support which the people of the Territories have given us on this and so many other occasions. It is our hope that the contents of this volume will be of particular value to those who live in the North.

ᑖᓐᓇ ᐅᖃᓕᒪᒐᓕᐊᕐᔪᓯᒪᔭᖅ ᑐᓵᖅᑎᑕᐅᕗᖅ ᐃᓄᒃ ᓄᑦ ᓄᓇᑦ ᓯᐊᕐ ᒥᐅᑕᓄᑦ
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INUKTITUT by
Rebecca Mike
Language Bureau G.N.W.T.

April 1986 hįdáh ʔélegu Néné gots'ę meni ke gots'udee gha lets'udee gha gonezǫ́ ʔagokįla ke kurats'éédi gharé hederi ʔedįhtl'é k'e kuts'ę rihęt'ǫ gú gok'e godéhtl'e. ʔekǫ́ ráts'eeréédee gharéá deri ʔedįhtl'é ts'ehsį. Hįdú gogha zǫ ʔadeedile, kóli gołǫ́ raxets'érádakedeeyįdi ghǫ máhsi kudidlį. Hįdá Néné meni ʔekǫ́ rádee hederi ʔedįhtl'é het'ókedéhʔá nidé yeriwę.

NORTH SLAVEY by
Lucy Ann Yakelaya
Language Bureau G.N.W.T.

K'eejit shreendit daiʔ, April, 1986, niłkhah ginjiʔ tr'adaaghoo ts'at NWT gwits'at dinjii lat azhik guuvah t'igidiʔih. Gwik'iigheʔ jii edinehtl'eh tr'ałtsaih ts'at judin azhik gwizhit iindiʔ, guuveenjit gałtsaih. Nakhwots'at tr'igiinjii eenjit khaiʔ oojiidinuh. Akohts'at jii nakhwonant gwizhit gwitch'in kat, jii edinehtl'eh guuveenjit nizii gedinjiidizhit.

LOUCHEUX by
Enna Vittrekwa
Language Bureau G.N.W.T.

April 1986, jądizį nen ts'į dëne ṭ'ą ʔedëri ʔerihtł'is ʔałé ghą náihįti-u, nuwe ts'įni si benáilni-u ʔederi ʔerihtł'is thiltsį ʔat'e. Té márci nįddhen, jądizį nen ts'į dene ʔederi xa-u tth'i hálaá nuwe ts'éheni. Jądizį nenk'e deneba ʔederi ʔerihtł'is bet'óreʔa nidé nįddhen ʔat'e.

CHIPEWYAN by
Leona Poitras
Language Bureau G.N.W.T.

April 1986 łets'eadi hò , edzanè k'e ts'ǫ done gogha segogįla eyit'à di nįhtł'ę̀ gigha hǫt'ę̀. Nezį gogha eghàlagįda hǫt'e haanikò di zǫ haani gogha eghàlagįda nįle , įdi si gots'àgįdi hǫt'e eyit'à mahsi gets'įwǫ , edzanè k'e done nàde si , di nįhtł'ę̀ gits'ǫ̀ hanegįʔa nindę̀ nets'įwǫ.

DOGRIB by
Mary Rose Drygeese
Language Bureau G.N.W.T.

April 1986, góhdli ndée gots'ęh dene ełéts'edeh gha seegogįįla, gonats'endih ghąádé á di edihtł'éh ts'ehtsį. Góhdli ndéh got'ię́ dánéht'é lih á t'ahsii t'áh naxets'ágeandi t'áh máhsi goʔenéhthidhę amii góhdli ndéh k'eh nágedeh á (deʔǫ́) azhii di edihtł'éh zhih thela gogha deʔǫ́ǫ́ met'áhodéʔá nidé eniidhę.

SOUTH SLAVEY by
Eleanor Bran
Language Bureau G.N.W.T.

EDUCATION, RESEARCH, INFORMATION SYSTEMS AND THE NORTH

"Developed from the Proceedings of the ACUNS meetings in Yellowknife, 17-19 April 1986"

Editor:
W. Peter Adams,
Association of Canadian Universities for Northern Studies
and
Trent University

Association of Canadian Universities for Northern Studies
Association universitaire canadienne d'Études nordiques

The cover photograph is of Yellowknife, Capital of the Northwest Territories, in 1985.
It was provided by D. Milligan, Culture and Communications, GNWT

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130 Albert Street, Suite 1915
Ottawa, Canada K1P 5G4
Tel: (613) 238-3525

Deposited at the National Library of Canada
Ottawa
1987

ISBN 0-921421-00-1

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INTRODUCTION
AND
OVERVIEW

PREFACE

Although, in one sense, this volume is the product of the annual meetings of the Association of Canadian Universities for Northern Studies (ACUNS) held in Yellowknife, 17-19 April 1986, the Contents represent much more than the Proceedings of one Conference. Discussions between ACUNS and groups in both Territories, about the roles of universities in the Canadian North, began long before the meetings were held and greatly affected their design and the nature of this volume. Negotiations with the Northern and Offshore Information Resources (NOIR) group and participation in their seminars resulted in the 'Information Systems' conference which preceded and overlapped with the ACUNS meetings. These activities resulted in one of the major Sections herein. Correspondence with people who made presentations at Yellowknife and with others who could not be there resulted in additions to papers and additional papers which considerably enhance the value of this publication.

ACUNS viewed its Yellowknife meetings as an opportunity for a "mutual briefing" between its 35 member universities and the people of the North. The idea was that Northerners would be able to express their views on what the universities are doing and what they should be doing. At the same time, the universities would have an opportunity to make Northerners more aware of their work in the North and their motives for undertaking that work.

We think this exercise was very worthwhile. It is our impression that many people in the North agree. We hope that this will be the first step of many.

This volume is part of ACUNS' contribution to the exercise. It is specifically designed to be of use to Northerners as well as to others interested in Northern Studies. The last Section, for example, is a guide to the universities in Canada which have a Northern Studies focus. Realizing that the Canadian university "system" is even more confusing to those outside than it is for those inside, the Section begins with an overview of the national university scene. There follows a guide to each university which, in addition to information on Northern activities, contains basic information on such areas as Native Studies, Distance Education, and Cooperative Programs which might be of special interest to Northern residents. Wherever possible, in this Section and throughout the volume, we have included 'phone numbers as well as addresses to facilitate communication with the individuals and organizations involved.

Quoique, d'une part, le présent ouvrage soit issu de la Rencontre annuelle de l'Association universitaire canadienne d'Études nordiques (AUCEN) qui s'est déroulée du 17 au 19 avril 1986 à Yellowknife, d'autre part il contient beaucoup plus que le Compte rendu d'une seule Conférence. Le débat sur le rôle des universités dans le Nord, entre l'AUCEN et les divers groupes intéressés dans les deux territoires, avait commencé bien avant la Conférence, et il a fortement influencé le contenu et la nature de cet ouvrage. Les négociations menées avec le Groupe de ressources documentaires sur le Nord et les régions marines (NOIR) et la participation à ses séminaires ont débouché sur la réunion de la Conférence sur les réseaux de documentation qui a commencé peu avant la Rencontre de l'AUCEN et a empiété sur celle-ci. Ces activités ont permis d'ajouter des compléments aux communications présentées et d'inclure d'autres textes qui ont considérablement enrichi l'ouvrage.

Les dirigeants de l'AUCEN espéraient que la Rencontre de Yellowknife permettrait une mise au courant réciproque des 35 universités membres et des Nord-Canadiens. Il fallait que ceux-ci puissent exprimer leur opinion sur ce que les universités accomplissent et sur ce qu'elles devraient faire. Parallèlement, les représentants des universités pourraient expliquer plus en détail leurs activités nordiques aux Nord-Canadiens, ainsi que les motifs qui guident leur établissement dans cette entreprise.

Nous estimons que cette Conférence a été très utile, et nous croyons que bien des gens du Nord sont d'accord. Il s'agit là, nous l'espérons, d'un premier pas qui sera suivi de bien d'autres.

Le présent ouvrage constitue la contribution de l'AUCEN à cet effort d'information réciproque. Il a été conçu pour servir aux Nord-Canadiens ainsi qu'aux autres personnes qui s'intéressent aux Études nordiques. Sa dernière section, par exemple, contient un guide des universités canadiennes actives en matière d'Études nordiques. Comme il est clair que le "réseau universitaire" canadien paraît encore plus embrouillé aux gens de l'extérieur qu'à ceux de l'intérieur, cette section trace d'abord un tableau synoptique de l'enseignement universitaire au pays. Ensuite, elle donne une description des activités de chaque université. Outre les renseignements sur ses activités nordiques, elle fournit une information de base sur des domaines tels que les Études autochtones, l'enseignement à distance et les programmes d'enseignement en alternance pouvant intéresser particulièrement les Nord-Canadiens. Chaque fois qu'il était possible, dans

The first major Section is devoted to **'Education and Research'** in general. It contains articles by Northerners and others on various aspects of (mainly) pre-college education and research. It is in this Section that Northerners most clearly express their views of university activities in the North and in the South. The Section is also notable for a number of clear statements on the nature and objectives of northern educational and research organizations. Here, as in the other Sections, a real effort has been made to ensure that each article contains enough information for an interested reader to begin to follow up points made in it.

The next Section represents the output of a workshop on **Higher Education and Training**. It centred around the exciting work and plans of Arctic College and its relations with the universities. Much material which relates to Arctic College is also to be found in other Sections — for example under Teacher Education and Distance Education. As Bill Stapleton and Ole Nielsen, Co-Chairs of the Workshop, point out in the first article of the Section, there is a very strong feeling in the North that the universities and colleges of Canada, individually and, especially, collectively should do more to assist the developing education systems of the Territories. The list of recommendations from this Workshop present an enormous challenge to a small organization such as ACUNS.

The third major Section of the volume is **Teacher Education in the North**. This represents what is almost certainly the first real attempt to give an overview of the diverse Teacher Education programs which exist in Northern Canada (in the Territories and the northern parts of the Provinces). Beginning with circumpolar and national overviews, of which the contributions of the late Jack Cram form a very significant part, the Section contains material from Labrador, Quebec and both the eastern and western parts of the N.W.T. We hope that the juxtaposition of accounts of these different systems will be of use to those in these and other isolated regions which are developing teacher education programs.

The **Distance Education and the North** Section is also based on a special workshop at the Yellowknife meetings. It too is a remarkable overview of what is going on across the nation, plus one contribution from Alaska. It contains articles on Distance Education in Newfoundland-Labrador, Ontario, Manitoba, Alberta and British Columbia and notes from Quebec. We hope that this overview of provincial activity will be of particular use to those in the Territories who are engaged in Distance Education work.

The **Information Systems and the North** Section has already been mentioned. Northern Studies (and the North) suffer from the lack of a basic information system. This is a problem for all circumpolar nations. The problem is that there is no easy way to pull together all the information on, say, a particular region in the North. Nor is it easy to gather all relevant information on a single theme — say permafrost or caribou. In Canada, there are hundreds of 'information systems' (ranging from libraries to on-line information services) which deal in part or entirely with 'the North'. The NOIR group (see article by Clarke and Goodwin) has begun to bring those responsible

cette section comme dans le reste de l'ouvrage, nous avons fourni les numéros de téléphone et les adresses des responsables pour faciliter la communication avec les personnes et les organismes concernés.

La première grande section porte sur l'**Enseignement et la recherche** en général. Elle contient des articles rédigés par des Nord-Canadiens et d'autres auteurs sur divers aspects de l'enseignement et de la recherche (surtout) pré-universitaires. C'est dans cette section que les Nord-Canadiens expriment le plus clairement leur opinion au sujet des activités universitaires dans le Nord et le Sud du Canada. On remarque qu'elle contient aussi un certain nombre de déclarations précises sur la nature et les objectifs des organes nordiques d'enseignement et de recherche. Là comme dans d'autres sections, on a fait un effort particulier pour assurer que chaque article contient suffisamment de renseignements pour que le lecteur intéressé puisse y donner suite sans difficulté.

La section suivante est issue de l'Atelier sur l'**Enseignement supérieur et la formation spécialisée.** Cet Atelier a porté surtout sur les travaux et les plans passionnants de l'Arctic College, et sur ses relations avec les universités. Le lecteur trouvera également, dans les autres sections, de nombreux renseignements sur l'Arctic College (par exemple dans la section sur la formation des enseignants et dans celle traitant de l'enseignement à distance). Comme MM. Bill Stapleton et Ole Nielsen, co-présidents de l'Atelier, l'indiquent dans le premier article de cette section, la population nordique est convaincue que les universités et collèges du Canada devraient contribuer plus largement, sur le plan individuel et surtout collectivement, au développement de l'appareil d'enseignement des territoires. La liste des recommandations issues de cet Atelier présente un défi énorme à un organisme d'ampleur restreinte comme l'AUCEN.

La troisième section de l'ouvrage porte sur la **Formation des enseignants dans le Nord.** Elle représente presque certainement le premier effort de description synoptique des divers programmes de formation des enseignants mis en oeuvre dans le Nord canadien (soit dans les territoires et les parties septentrionales des provinces). Commençant par une vue synoptique circumpolaire puis canadienne, au sujet de laquelle le regretté Jack Cram a fait une très importante contribution, cette section contient des données concernant le Labrador, le Québec et les moitiés orientale et occidentale des T.N.-O. Nous espérons que la juxtaposition des descriptions de ces différents appareils de formation des enseignants sera utile aux personnes de ces régions et d'autres zones isolées qui sont chargées de mettre sur pied des programmes de formation des enseignants.

La section traitant de l'**Enseignement à distance dans le Nord** est aussi issue d'un Atelier spécialisé de la Rencontre de Yellowknife. Elle constitue une remarquable vue synoptique de l'effort accompli dans le pays, et englobe une contribution venant d'Alaska. Elle contient des articles portant sur l'enseignement à distance dans Terre-Neuve & Labrador, l'Ontario, le Manitoba, l'Alberta et la Colombie-Britannique, plus quelques remarques sur la situation au Québec. Nous espérons que cette vue synoptique des efforts accomplis dans les provinces sera d'un intérêt particulier pour les responsables

for these systems together. The Section contains accounts of the work of some thirty of these systems, more than a third of which are located in the North. We believe that the coverage of Territorial libraries alone is a unique contribution to the cause of an improved northern information system for Canada. The libraries of the Territories are truly a 'Pot of Written Gold' (see article by Abel) for Northerners, for the nation and the international Northern Studies community. ACUNS hopes that considerable strides will be made soon to link these and other information systems so that Northerners and others have full access to their contents.

The 'exercise' which resulted in this volume was conceived by the ACUNS Special Committee on Advanced Education & Research in the Canadian North which was initiated by Gordon Nelson (then President of ACUNS) and chaired by Ole Nielsen. The Committee members were Ole Nielsen, Jim Carefoot, Gordon Nelson, Marc-Adélard Tremblay and Peter Adams. The original committee was expanded into an organizing committee for the Yellowknife meetings. The additional members were Ed Duggan and Ken Lovely of the Ministry of Education, GNWT, and Dan Billing (succeeded after his retirement by Bob Janes) of the Science Institute of NWT. Valuable advice was provided at this stage by Lorne Smith of the Ministry of Education, GNWT, and Colin Heartwell and Andris Rode of the Government of Yukon. Louise Nicklin of the Language Bureau, GNWT, provided translations into the official languages of the NWT.

The chairpersons of various sessions (see the Sections of this volume) and others were extremely important in the design and operation of the meetings. These included the late Jack Cram, Bill Stapleton (of Arctic College), David Wilman (of EATEP), Jim Carefoot, Gordon Nelson, Marc-Adélard Tremblay, Ole Nielsen and Lorne Smith. Elizabeth Clarke (of C-FER) and Ross Goodwin (AINA) were instrumental in putting together the Information Systems part of the program.

We are particularly grateful to Ed Duggan and Ken Lovely for their support before, during and after the meetings.

These meetings were hosted by the Hon. Dennis Patterson, Minister of Education of the N.W.T. Mr. Patterson gave both his personal and official support to the conference and its various products including this volume. ACUNS and all those involved (several hundreds) are most grateful to him and his colleagues in the GNWT.

ACUNS has always received consistent support for all its endeavours from the federal Ministry of Indian and Northern Affairs. The moral and other support received for this project, from the Hon. David Crombie, Minister, and his office, was exceptional. ACUNS greatly appreciates the assistance and encouragement received for this very important project.

Within Indian and Northern Affairs, our contact is with the Circumpolar and Scientific Affairs Directorate, Donat Savoie, Director. The Editor and the Association express their gratitude to M. Savoie and his colleagues.

du développement de l'éducation à distance dans les territoires.

Nous avons déjà mentionné la section sur les **Réseaux de documentation du Nord.** Les études nordiques (et le Nord canadien) pâtissent de l'absence de réseau de documentation de base. C'est là une difficulté à laquelle font face toutes les régions circumpolaires. Il n'existe pas, en effet, de moyen facile pour grouper toute l'information concernant, disons, une région nordique particulière. De même est-il malaisé de recueillir toutes les données pertinentes sur une question bien circonscrite, par exemple le pergélisol ou le caribou. Le Canada dispose de centaines d'organes de documentation allant des bibliothèques aux services de renseignements sur demande et qui portent, en partie ou entièrement, sur le Nord. Le Groupe des ressources documentaire sur le Nord et les régions marines (NOIR) a entrepris de concerter l'action des responsables de ces organes. Cette section contient des descriptions des activités de quelque trente de ces organes, dont plus d'un tiers sont situés dans le Nord du pays. Nous estimons que la participation des bibliothèques des territoires constitue, à elle seule, une contribution sans pareille à l'amélioration des réseaux de documentation du Canada. Ces bibliothèques sont véritablement des "mines d'or documentaire" pour les Nord-Canadiens (voir l'article d'Abel), pour le pays et pour la collectivité internationale des Études nordiques. L'AUCEN espère qu'on réalisera bientôt de considérables progrès dans l'articulation de ces bibliothèques et d'autres organes de documentation, afin de permettre aux Nord-Canadiens et aux autres intéressés d'avoir accès à la masse collective d'information.

L'action qui a débouché sur le présent ouvrage a été conçue par le Comité spécial de l'AUCEN pour l'enseignement supérieur et la recherche dans le Nord canadien, mis sur pied par M. Gordon Nelson (alors président de l'AUCEN) et présidé par Ole Nielsen avec, comme membres, Jim Carefoot, Gordon Nelson, Marc-Adélard Tremblay et Peter Adams. Le Comité originel a été transformé en Comité d'organisation de la Rencontre de Yellowknife par l'inclusion de MM. Ed Duggan et Ken Lovely, du ministère de l'Éducation des T.N.-O., et Dan Billing (remplacé après son départ à la retraite par Bob Janes), de l'Institut des sciences des T.N.-O. À ce moment, MM. Lorne Smith, du ministère de l'Éducation des T.N.-O. et Colin Heartwell et Andris Rode, de l'Administration du Yukon, ont fourni leurs avis judicieux. Mme Louise Nicklin, du Bureau des langues officielles des T.N.-O. a effectué les traductions dans les langues officielles des T.N.-O. Les présidents des séances thématiques (voir les diverses sections du présent ouvrage) et d'autres personnes ont contribué de façon cruciale à la préparation de ces rencontres et à leur déroulement. Il s'agit du regretté Jack Cram, de MM. Bill Stapleton (Arctic College), David Wilman (EATEP), Jim Carefoot, Gordon Nelson, Marc-Adélard Tremblay, Ole Nielsen et Lorne Smith. Mme Elizabeth Clarke (C-FER) et M. Ross Goodwin (AINA) ont contribué à mettre sur pied le volet du programme portant sur le réseau de documentation.

Nous sommes spécialement reconnaissants envers MM. Ed Duggan et Ken Lovely pour leur aide avant, pendant et après la Rencontre.

The Editor would also like to express his appreciation to Marc-Adélard Tremblay, President of ACUNS, and his Board for their support throughout this project. ACUNS is, in many ways, a small organization (see article by Tremblay in the following Section). Its resources were fully stretched by these important meetings and their ramifications. The Board had to approve a deficit budget a year before the Yellowknife meetings were held during a period of considerable economic uncertainty. Their confidence was greatly appreciated.

I would also like to thank all participants in the Yellowknife meetings and all contributors to this volume for their gifts of energy and creativity.

This is a very worthwhile project that we have been engaged in, the start, we hope, of great things to come.

Finally, I would thank Eileen van Heyst, Administrative Officer of ACUNS who was, to mix metaphors, the pivot around which the project revolved and the foundation upon which this volume was built.

W. Peter Adams,
Editor

Celle-ci s'est déroulée sous les auspices de l'honorable Dennis Patterson, Ministre de l'Éducation des T.N.-O. M. Patterson a accordé son soutien tant personnel qu'officiel à la Conférence et à ses diverses suites, y compris le présent ouvrage. L'AUCEN et tous les participants (soit plusieurs centaines de personnes) le remercient de tout coeur, ainsi que ses collègues du gouvernement des T.N.-O.

L'AUCEN a toujours bénéficié d'un soutien indéfectible du ministère fédéral des Affaires indiennes et du Nord canadien pour toutes ses entreprises. L'honorable David Crombie, chef de ce ministère, a accordé un soutien moral et matériel exceptionnel à la Conférence. L'AUCEN fait grand cas de ce soutien et de cet encouragement obtenus pour la réalisation de ce projet très important.

Au sein du ministère des Affaires indiennes et du Nord canadien, c'est avec la Direction des affaires circumpolaires et scientifiques que l'AUCEN a pris contact. L'Association et le directeur de publication adressent leurs remerciements au chef de cette Direction, M. Donat Savoie, et à ses collègues.

Le directeur de publication adresse également ses remerciements à M. Marc-Adélard Tremblay, Président de l'AUCEN, et à son conseil d'administration pour l'aide qu'ils lui ont fournie au cours de la préparation du manuscrit. Sous bien des aspects, l'AUCEN est un organisme de faible taille (voir l'article de M. Tremblay dans la section qui suit). Ses ressources ont été largement mises à contribution par cette importante Conférence et ses suites. Les conseil d'administration a dû approuver un budget déficitaire une année avant la Rencontre de Yellowknife, au cours d'une période de grande incertitude économique. Nous faisons grand cas de sa confiance.

Je remercie également tous les participants à la Rencontre de Yellowknife et tous les auteurs qui ont contribué à la rédaction du présent ouvrage, pour l'effort de création et l'énergie qu'ils lui ont consacrée. Il s'agit d'une entreprise menée à bien qui offre de grande promesses d'avenir.

Pour terminer, je remercie également Mme Eileen van Heyst, Agente d'administration de l'AUCEN, qui a été à la fois le pivot autour duquel a tourné l'organisation de la Conférence et la pierre angulaire de l'élaboration du présent ouvrage.

Le directeur de publication,
W. Peter Adams

ADDRESS TO THE ACUNS CONFERENCE ON HIGHER EDUCATION AND RESEARCH IN THE NORTH, YELLOWKNIFE, N.W.T., APRIL 1986

The Honourable Dennis Patterson
*Minister of Education of the Northwest Territories**

I am very pleased to address this important meeting of the Association of Canadian Universities for Northern Studies. I would like to welcome you to Yellowknife and to the Northwest Territories. Welcome is a word which understates my delight at the fact that these meetings of the Association of Canadian Universities for Northern Studies are being held in the North. It is most appropriate for you to meet in Yellowknife. This choice of location shows that you recognize the need to establish a higher profile in the North and to provide Northerners with an overview of your organization and its role in the conduct of northern research studies. Now that your Association will have had its first meeting north of the 60th parallel, perhaps you will be inspired to come north of the tree line next time. Although I know it costs more, I would ask you, during these meetings, to consider meeting more often in a northern location. Along these lines, I wouldn't be a very good politician if I didn't exhort you to consider having your next meeting in my home community and constituency in the Baffin!

As the Minister of Education for the Territories, I am responsible for education and training programs ranging from kindergarten to grade 12 in the territorial school system, through adult and continuing education, the NWT apprenticeship program, public service training and post-secondary education provided by the Arctic College system. Interesting developments have taken place in northern education over the past few years. Perhaps the most important of these is the increasing commitment of parents to the education of their children. They are demanding a more active role in the control of the education system. School Boards have existed in Yellowknife for many years now. Last year, for the first time, a Board of Education was established outside the capital. The Baffin Divisional Board of Education came into being on November 1, 1985. Other regional education councils, composed of elected community people, are rapidly developing towards Board status. This initiative came about in direct response to the recommendations of the Legislative Assembly's Special Committee on Education, which reported in 1982.

I was a member of that Committee as a Member of the Legislative Assembly and was appointed to this portfolio shortly thereafter. We have not been successful in implementing all the recommendations of the Task Force but we have made progress. I anticipate even greater progress over the next few years. The N.W.T. population is extremely youthful. Our birth rate of about 30 per thousand rivals the rates found in developing nations and is the highest rate of any Canadian jurisdiction. These factors will continue to place a great deal of pressure on our educational system to prepare students for life and work.

In 1985 the Province of Alberta and the Northwest Territories signed an Accord which permits the sharing of educational resources and materials. We now have access to expertise and materials previously unavailable to the Territories. Further, secondary school programs developed by and for the N.W.T., such as Dene and Inuit studies courses, will now be recognized for credit by the Province of Alberta. This agreement is a good example of the kind of arrangements which should be made with southern universities in recognition of the absence of a northern university and the emerging nature of the Northwest Territories.

Many of you will be familiar with the discussions which have taken place over the past 15 years for a University of the North. From the beginning, these discussions were plagued by a fundamental disagreement between the northerners involved and the academics and visionaries like Richard Rohmer, who provided the initial inspiration. This disagreement was about control, direction and whose interest the University would serve. Some said that there was a solid need to bring such an institution to the North for the benefit of students, while others saw it as a home for southern researchers in the North.

At the very least, the debate succeeded in bringing home to the Territorial Government of the day the important issue of higher education for its citizens. We are working up from educational needs at the community level. That is why you will find such a strong emphasis on adult and continuing education, job training and decentralization in our system. Our first priority is, and must be, the empowerment of northerners through any system of post-secondary education.

The Northwest Territories enjoys the same arrangements as the provinces for accessing federal funds under the Established Programs Financing Act. Funds provided for this purpose by the federal government exceed nine million dollars and provide support for N.W.T. community college programs, as well as forming the monetary base for the Territorial Government's Student Financial Assistance Program. The Arctic College system, with a budget of some eleven million dollars, provides institutional programs and extension courses in most settlements of the Territories and has contributed heavily to the bank of employment skills in the North. I know that the College President, Mr. Bill Stapleton, will be addressing you later in the Conference (see paper in this volume), so I will not dwell on the details of the College's activity or its history.

In addition to this major investment in post-secondary education for northern students, the Government of the N.W.T. provides financial assistance to students in the form of loans and grants to enable them to take advantage of post-secondary education within and outside the N.W.T. Over 500 students are now assisted annually. Affirmative action provisions were implemented in 1982 to provide extra incentives to students of native ancestry. Since then about 20% of all students assisted have been NWT native people. I know that this proportion is still not good enough. But it offers some improvement in our efforts to restructure the work force so that it is more representative of the makeup of the population.

The Northwest Territories has a brain drain in that many college and university graduates have traditionally left the North to obtain work in the south. As an incentive for graduates to live and work in the North, student loans are forgiven for individuals who return to work in the N.W.T. for periods roughly equivalent to the duration of their course work. This program of student financial assistance supports students who wish to benefit from university and college programs which could not be delivered in the N.W.T. owing to limited numbers of students. Last year we spent $2,689,548 supporting students in southern institutions from Memorial University, Newfoundland to the University of Victoria, British Columbia, to Harvard. The Arctic College delivers employment-oriented education and training programs at regional campuses and at the community level in the N.W.T. Through this decentralized delivery system we try to avoid, as much as possible, the disruption caused when northern students must leave family and home to further their education.

We also wish to avoid the unhealthy "edifice complex" which has led to fiscal paralysis for many southern institutions. The original office of the Thebacha campus of Arctic College in Fort Smith was built on the sly as a "project" by pre-employment carpentry students. We are using a surplus U.S. Army complex in Frobisher Bay to offer Iqaluit campus courses, and we hope to acquire a surplus Canadian Forces Base in Inuvik at a nominal sum for similar purposes. Most of our new community schools have built-in adult facilities, suitable for extension courses. By the application of traditional northern ingenuity, a high proportion of Arctic College students are now achieving their educational goals through extension courses in their home communities.

College programs are gradually being structured to provide increased accessibility through flexible admission requirements and an emphasis on field-based delivery. This approach is epitomized by the Eastern Arctic Teacher Education Program (see papers elsewhere in this volume) which currently enjoys credit transfer arrangements with McGill University in Montreal. The first three years towards an undergraduate degree in Education are now being delivered by the Arctic College in Frobisher Bay. The program places a heavy emphasis on the use of Inuktitut in the classroom and the overwhelming majority of students are Inuit. In addition to the approximately 20 students involved in an institutional setting, another 45 to 50 are enrolled in the field-based component which allows students who are currently classroom assistants to take short intensive courses as their circumstances permit.

As a result, in the Baffin Region, Inuit graduates occupy most of the teaching positions from kindergarten to grade 3. The Eastern Arctic program has now expanded its mandate to educating students to teach up to grade 6 in Baffin Region schools. This successful program is contributing to an education system made meaningful by the presence of local people as teachers in the classroom. McGill has taken a flexible approach to credit transfer arrangements and the provision of specialized support services, and thus has been an invaluable aid to this developing program. Similar arrangements are being negotiated with the University of Saskatchewan for the Western Arctic Teacher Education Program (see elsewhere in this volume) which is now being restructured along the lines of its eastern counterpart.

Northern research studies must focus on northern needs and address the priorities of industry, government and native northerners. Too often we in the North have been objects of study for researchers who acquire high academic reputations by spending a few months in the NWT each summer. There are many notable exceptions where southern researchers have learned from northern communities what it is the communities want to know, and where the researchers have trained and employed northerners to gather useful data which is then given back to the communities concerned. I would like to give due credit to research organizations such as the University of Calgary's Arctic Institute of North America (among others) which conducted its northern native employment and training study in just this manner. The challenge I would like to leave with the member institutions of ACUNS is to make this kind of research not the exception, but the rule. I understand that the Honourable David Crombie, Minister of Indian Affairs and Northern Development, intends to set up a new Polar Institute to help co-ordinate northern scientific research (see Crombie paper in this volume). Why not locate this institute in the Northwest Territories where its staff could become real northern experts by living among us during the winter as well as the summer?

There is a need for all universities which are active in the North to consider means by which they can contribute to northern education. For the next ten years there is, in my judgment, no strong possibility for a northern university. Efforts in that direction would seriously detract from the success we are achieving through the Arctic College. Nevertheless, you can help us begin to make it happen.

My officials are currently dealing with organizations such as Athabasca University and the University of Alberta to negotiate expanded university extension offerings in larger centres such as Yellowknife, Inuvik and Frobisher Bay. Consideration is being given to the use of technology to deliver programs at a distance in smaller northern settlements. Through these efforts we hope to help those residents who have the ability, but not necessarily the opportunity, to complete university courses. As a further effort in that direction, student financial assistance is now available through the Government of the N.W.T. to reimburse students for correspondence course costs associated with post-secondary education.

The N.W.T. college system concentrates on serving clients who may not be eligible for university entrance. Our experience tells us that once they have passed one hurdle and graduated from a two-year program, they often look beyond college to university. Whenever course credits can be accepted by universities, the student can avoid needless repetition of programs. Arctic College will be seeking to enter into more and more formal arrangements of this nature over the next few years as our system expands, and your co-operation and assistance will be critical. Flexibility and uncomplicated speedy decision-making will be required from universities.

The final area where we need your help is in the sharing of experiences to avoid the pitfalls which you have already overcome. As new programs and course offerings are developed we will be seeking advice from institutions with similar aims and objectives. Any assistance you can provide in the form of advice, program materials or resource staff will be helpful.

I hope that your discussions over the next three days will give you useful information about our needs. I am also hopeful that we in the North will benefit from the information which you can provide and the contacts which result from this important gathering, and I look forward to meeting many of you again, informally, during this Conference.

Note

The full references to the report of the Special Committee on Education, 1982 and the 1985 NWT-Alberta Accord are:

NWT-Alberta 1985 Memorandum of Understanding re Secondary School Programs, signed 22 October (see Secondary Education in Alberta, Policy Statement, Government of Alberta, June 1985).

NWT — Legislative Assembly, 1982. Learning: Tradition and Change in the Northwest Territories, Special Committee on Education, 172 p. (ed).

ADDRESS TO THE ACUNS CONFERENCE ON HIGHER EDUCATION AND RESEARCH IN THE NORTH, YELLOWKNIFE, N.W.T., APRIL 1986

The Honourable David Crombie, P.C., M.P.
Minister of Indian Affairs and Northern Development

Let me begin this evening by thanking the Association, and particularly you Dr. Tremblay, for the invitation to address your conference. I've been looking forward to this particular speaking engagement for some time because your Association and I have many common goals and challenges.

I want to join the Government of the Northwest Territories in commending you for holding your 1986 conference in Yellowknife. What better way to stimulate discussions about the North than by meeting in one of its capitals?

There is representation from the Government of Yukon here as well, I understand.

Professionally, your goals are to learn and to educate. Since taking over the Indian Affairs and Northern Development portfolio, those have been my goals as well. I have been striving to learn as much as I can about the North; and I have been working hard to educate my

ALLOCUTION À LA CONFÉRENCE SUR L'ENSEIGNEMENT SUPÉRIEUR ET LA RECHERCHE DANS LE NORD PARRAINÉE PAR L'AUCEN, À YELLOWKNIFE, T.N.-O., AVRIL 1986

L'Honorable David Crombie, C.P., Député
Ministre des Affaires Indiennes et du Nord canadien

Permettez-moi d'abord de remercier l'Association universitaire canadienne d'études nordiques et tout particulièrement le professeur Tremblay, de m'avoir invité à prendre la parole dans le cadre de votre conférence. C'est avec plaisir que je voyais venir cette rencontre car votre association et moi-même partageons des objectifs et des défis.

Je désire également me joindre au gouvernement des Territoires du Nord-Ouest pour vous féliciter d'avoir tenu votre conférence de 1986 à Yellowknife. N'est-ce pas le meilleur moyen de stimuler les discussions sur le Nord que de tenir la réunion dans l'une de ses capitales?

Je crois aussi savoir que des représentants du gouvernement du Yukon sont ici présents ce soir.

Sur le plan professionnel, vos objectifs sont d'apprendre et de transmettre votre connaissance. Depuis que l'on m'a confié le ministère des Affaires indiennes et du Nord canadien, je poursuis ces mêmes objectifs. Je me suis

Parliamentary colleagues and the Canadian public on northern issues.

I've travelled more than 130 000 kilometres criss-crossing this country, in the last year-and-a-half. I've also been to Greenland, Iceland and Denmark because I believe a lot can be usefully exchanged among polar nations. This is one of the reasons I will be visiting the Soviet Union at the end of next month.

Your organization is working to improve Canadian research and scientific contacts with other countries having northern interests. This is also a goal of my department.

A concrete example is the Canada-USSR Arctic Science Exchange Program, which encourages study and the exchange of scientific information in arctic petroleum and geoscience, northern environment, northern construction and social and educational issues. Harald Finkler, one of my officials, along with Abraham Tunraluk, from the Inuit community of Arctic Bay, comprised the Canadian delegation that just returned from the Soviet Union. Social issues were the main topics for discussion.

Harald and Abraham are with us this evening and I encourage you to approach them later for their views on the value of Canada's participation in such circumpolar exchanges involving northern peoples and scientists.

I cannot overstate the importance of agreements such as the exchange program. Canada is a polar nation and we need to establish and maintain cultural and educational links with our circumpolar neighbours.

The federal commitment to this principle is clear in my department's continued support of the Inuit Circumpolar Conference.

The ICC represents the interests of Inuit in Canada, Greenland and Alaska. It strengthens pride in Inuit achievements and encourages Inuit leaders to plan for a better future. In recognition of its important work, my department contributed funding of $100 000 and matched funding for an additional $100 000 to the ICC's Canadian Regional Office for 1985-86. I plan to continue that kind of support in the future.

You are acknowledged experts on the circumpolar world; I am not. But in my travels, I've learned some very important things about the North.

I've learned first of all that the North is a place of community. The communities of the North are poised between their history and their future. They want to remain who they are yet participate in a wider experience.

I've also learned that northerners have a special bond with the environment. In the North, environment is not a policy or debating point. Environment is a place that sustains and gives life.

The third thing I've learned is that the circumpolar world is a place of wealth. There is a growing acceptance of development on terms which respect the environment and contribute to the wealth of northern communities.

The nurturing of community, the preservation of the

attaqué à la tâche d'en apprendre autant que possible sur le Nord; et je déploie beaucoup d'efforts à faire connaître à mes collègues du Parlement et au public canadien les questions qui touchent le Nord.

Durant les derniers dix-huit mois, j'ai parcouru plus de 130 000 kilomètres à travers le pays. Je me suis également rendu au Groenland, en Islande et au Danemark car j'ai la conviction que l'on peut échanger beaucoup de renseignements utiles entre pays circumpolaires. Et c'est pour cette raison entre autres que je visiterai l'Union soviétique à la fin du mois prochain.

Votre organisation travaille à améliorer les contacts canadiens en matière de recherche et de science avec les autres pays qui ont des intérêts dans le Nord. C'est là également un objectif de mon ministère.

À titre d'exemple concret, mentionnons le Programme canado-soviétique d'échange de connaissances scientifiques sur l'Arctique, lequel favorise l'étude et l'échange de renseignements scientifiques touchant le pétrole et la géoscience dans l'Arctique, l'environnement du Nord, la construction dans le Nord ainsi que les questions sociales et d'éducation dans ces régions. M. Harald Finkler, un de mes hauts fonctionnaires, de même que M. Abraham Tunraluk, de la collectivité inuit de Arctic Bay, composaient la délégation canadienne qui revient justement de l'Union soviétique, où l'on s'est penché en premier lieu sur les questions sociales.

Harald et Abraham sont parmi nous ce soir et je vous invite à discuter avec eux pour connaître leurs points de vue sur la valeur de la participation du Canada à de tels échanges, entre pays circumpolaires, qui impliquent des scientifiques et des gens du Nord.

Je ne saurais trop insister sur l'importance des accords comme le programme d'échange. Le Canada est une nation circumpolaire et nous nous devons d'établir et d'entretenir des liens culturels et éducatifs avec nos voisins des pays circumpolaires.

L'engagement fédéral à l'égard de ce principe ressort clairement dans l'appui continu qu'offre mon ministère à la Conférence circumpolaire inuit (CCI).

La CCI représente les intérêts des Inuit du Canada, du Groenland et de l'Alaska. Elle permet de renforcer la fierté des Inuit dans leurs réalisations et incite les leaders inuit à planifier un avenir meilleur. C'est en reconnaissance de cet important travail que mon ministère a accordé un financement de 100 000 $ et un montant additionnel de 100 000 $ en fonds de contrepartie au Bureau canadien de la CCI pour 1985-86. Je prévois d'ailleurs maintenir ce genre d'appui dans l'avenir.

Vous êtes des experts reconnus sur le monde circumpolaire, ce que je ne suis pas. Mais dans mes pérégrinations, j'ai appris des choses très importantes au sujet du Nord.

J'ai d'abord appris que le Nord, dans sa totalité, est un lieu de collectivités. Et les collectivités du Nord sont suspendues entre leur histoire et leur avenir. Elles veulent demeurer ce qu'elles sont et participer tout de même à une expérience plus globale.

environment and the creation of wealth . . . these are my guideposts for development in the North.

I recommend them to you. Because as political institutions in the North evolve and grow, they will be calling upon the scientific and educational community for insights and solutions to particularly northern problems.

In my view, successful political development in the North has three basic requirements:

— progress on native land claims;

— constitutional development; and

— the transfer of provincial-type programs and responsibilities.

With respect to claims, we have a chance to fashion a satisfactory long-term relationship between the northern aboriginal peoples and other Canadians.

Last month, I released the report of the Federal Task Force on Comprehensive Claims. As you know the report puts forth some innovative approaches to dealing with land claims. After a period of public consultation, I intend to make some policy recommendations to Cabinet this summer. I would welcome your views.

Regarding constitutional development, I believe that the initiative must come from the North. As the federal minister with primary responsibility for the North and the well-being of its aboriginal inhabitants, I have emphasized, and will continue to emphasize, the necessity for broad consensus on major issues of constitutional change.

In Yukon, a Memorandum of Understanding has brought together the Government of the Yukon and the Council for Yukon Indians. In the N.W.T., the Constitutional Alliance, through the Western Constitutional Forum and the Nunavut Constitutional Forum, continues to work on division and the drafting of new territorial constitutions. While consensus is difficult to achieve, it is in the best interest of both Northerners and other Canadians, and is in keeping with the best traditions of our Confederation, that such consensus is realized.

On transfer of provincial-type programs and responsibilities, the guiding consideration will be the preference of northerners.

However dynamic the program of political development, the Federal Government will always maintain a special interest in the North:

- because we have a special and historic relationship with native people;
- because of the unique importance of northern scientific research and resource development; and
- because Canada has a strategic circumpolar presence just like the USSR, Alaska, Scandinavia and Greenland.

Northerners *should* and *can* and *are* developing northern methods of arriving at solutions. A good example of this is the Science Institute of the Northwest Territories (see elsewhere in this volume) which has strong support from your association.

J'ai aussi appris que les habitants du Nord sont tout particulièrement liés à leur environnement. En effet, dans ces régions, l'environnement n'est pas une question de politique ou un point à débattre. L'environnement, c'est précisément ce qui donne et entretien la vie.

La troisième chose que j'ai apprise, c'est que le monde circumpolaire est un endroit de prospérité. On accepte de plus en plus l'exploitation dans des conditions qui respectent l'environnement et contribuent à l'enrichissement des collectivités du Nord. La valorisation de la vie communautaire, la préservation de l'environnement et l'avènement d'une certaine prospérité ... ce sont là mes trois points de repère pour le développement dans le Nord.

Je vous les recommande. Car à mesure que les institutions politiques du Nord connaîtront évolution et croissance, elles feront appel au monde de l'enseignement et des sciences pour obtenir des renseignements éclairés et des solutions à des problèmes inhérents au Nord.

À mon avis, le succès du développement politique dans le Nord repose sur trois exigences fondamentales:

- l'avancement dans le règlement des revendications foncières;
- le développement constitutionnel; et
- le transfert des programmes et des responsabilités de type provincial.

En ce qui a trait aux revendications, nous pouvons arriver à concevoir des rapports satisfaisants et à long terme entre les habitants du Nord et les autres Canadiens.

Le mois dernier, j'ai publié le rapport du Groupe d'étude de la politique des revendications globales. Comme vous le savez, ce rapport préconise des approches novatrices en ce qui a trait aux revendications foncières. Après une période de consultation publique, j'ai l'intention, à l'été, de faire des recommandations au Cabinet en matière de politique. J'apprécierais donc que vous me fassiez connaître vos points de vue.

Pour ce qui est du développement constitutionnel, j'estime que les initiatives doivent émaner des habitants du Nord. À titre de ministre fédéral responsable au premier chef du Nord et du bien-être de ses autochtones, j'insiste et je continuerai à insister sur la nécessité d'un consensus sur les principales questions touchant les changements constitutionnels.

Au Yukon, le gouvernement et le Conseil des Indiens ont signé un protocole d'entente. Dans les Territoires du Nord-Ouest, l'Alliance constitutionnelle, par le biais de l'Assemblée constitutionnelle de la région ouest et de l'Assemblée constitutionnelle du Nunavut continue à travailler à la division du territoire et à l'ébauche des nouvelles constitutions territoriales. Bien qu'il soit difficile d'en arriver à un consensus, il y va de l'intérêt tant des habitants du Nord que des autres Canadiens et il est tout à fait conforme aux meilleures traditions de notre confédération qu'un tel consensus soit réalisé.

Pour ce qui est du transfert des programmes et des responsabilités de type provincial, la considération-clé sera la préférence des habitants du Nord.

Tout aussi dynamique que puisse être le programme de

The Science Institute was established by the Legislative Assembly of the Northwest Territories to foster northern science and to train northerners. It emerged through the close collaboration of my departmental officials working closely with other departments and northerners. It is an initiative which is being implemented in the North by northerners.

It is fitting that the recipients of my department's 1984 and 1985 Centenary Medals for Northern Science are both members of the Board of the Science Institute of the Northwest Territories.

Dr. Ross Mackay of the University of British Columbia was presented with the first annual award in 1984 in recognition of his long career as a pioneer in permafrost research.

Dr. Otto Schaefer, who until his retirement was Director of the Northern Medical Research Unit of Health and Welfare Canada, received the award in 1985. Dr. Schaefer has devoted virtually his entire career to the health problems and health care needs of northern native people.

My department's Northern Scientific Training Program, in which 27 Canadian universities and 300 students participate, supports these universities in providing training to students and encourages them to develop a commitment to northern work. It allows first rate science to be undertaken in the North.

Your Association's Canadian Northern Studies Trust, Dr. Tremblay, is another good example of an initiative very pertinent to the North. The program's studentships, senior fellowships and special awards for northerners are much sought after by people from a wide variety of backgrounds.

I commend your efforts to develop a core of specialists with northern experience and to promote educational opportunities in the North. All of the Trust program's funding comes from private organizations, and this is welcome to a government that believes in private sector initiative. The Trust program complements the Northern Scientific Training Program of my department.

I also want to congratulate your organization for its efforts to increase the role of Inuit, Dene and Metis in applied research. Today, more research is being done on issues identified by indigenous peoples themselves, and I think that is an important step.

The Association of Canadian Universities for Northern Studies is in the mainstream of scientific and educational work in the North today. That is one reason it receives core funding of $180 000 annually from my department. I consider this financial support a good investment.

It is also why I asked your executive director, Dr. Peter Adams, to join a Task Force studying the need for a National Polar Institute. I want to take this opportunity to thank Professor Adams, Dr. Fred Roots, Peter Burnet and Mark Gordon for their excellent work to date on investigating the feasibility of establishing a Polar Institute for Canada.

Based on a preliminary report I received on March 17, I can see that Task Force members have been very busy.

développement politique, le gouvernement fédéral gardera toujours un intérêt spécial pour le Nord:

- parce que nous entretenons des relations spéciales et historiques avec les autochtones du Nord;
- à cause de l'importance unique de la recherche scientifique et de l'exploitation des ressources dans le Nord; et
- parce que le Canada y jouit d'une présence circumpolaire stratégique tout comme l'URSS, l'Alaska, la Scandinavie et le Groenland.

Les habitants du Nord *devraient* et *peuvent* concevoir des méthodes qui leur sont propres pour trouver des solutions, et c'est ce qu'*ils font* actuellement. L'Institut scientifique des Territoires du Nord-Ouest (v. chapitre dans cette volume) qui reçoit un excellent appui de votre association, en est un bon exemple.

L'institut scientifique a été établi par l'assemblée législative des Territoires du Nord-Ouest en vue de favoriser les sciences nordiques et de former les habitants du Nord à cet égard. Cet institut découle d'une collaboration étroite entre les hautes fonctionnaires de mon ministère, les autres ministères et les habitants du Nord. Il s'agit d'une initiative en voie d'être mise sur pied dans le Nord par les habitants de ce territoire.

Aussi, il va de soi, que les récipiendaires des Médailles du Centenaire pour la recherche scientifique sur le Nord, décernées par mon ministère en 1984 et 1985, soient des membres du conseil de l'Institut scientifique des Territoires du Nord-Ouest.

La professeur Ross Mackay, de l'université de la Colombie-Britannique, a été le premier, en 1984, à obtenir ce prix en reconnaissance de sa longue carrière à titre de pionnier dans la recherche relative au pergélisol.

Le Dr. Otto Schaefer, qui jusqu'au moment de sa retraite, occupait le poste de directeur de l'unité de recherche médicale sur le Nord, Santé et Bien-être Canada, a reçu le prix en 1985. Tout au long de sa carrière, le docteur Schaefer s'est consacré quasi entièrement aux problèmes de santé et aux besoins en matière de santé des autochtones du Nord.

À mon ministère, le programme de formation scientifique dans le Nord, auquel participent 27 universités canadiennes et 300 étudiants, appuie les universités en question dans leurs efforts pour donner la formation aux étudiants et les encourager à prendre un engagement envers le marché du travail dans le Nord. Grâce à ce programme, on peut y entreprendre des travaux scientifiques de premier ordre.

De votre côté, M. Tremblay, la Fiduciaire canadienne d'études nordiques de votre association constitue un autre bon exemple d'une initiative très à-propos dans le Nord. Les bourses d'étude, les bourses universitaires et les bourses spéciales pour les habitants du Nord sont très recherchées des gens de disciplines très variées.

Qu'il me soit permis de louer les efforts que vous avez entrepris pour mettre sur pied un noyau de spécialistes ayant une expérience dans le Nord et pour promouvoir les possibilités d'éducation dans le Nord. La totalité du financement de la Fiduciaire provient d'organismes pri-

Some 800 letters asking for comments and suggestions have been distributed to governments, the academic community, native groups, local community and northern organizations, industry and public interest groups. As well, they have been in contact with concerned organizations in the United States, Sweden and Denmark.

The Task Force has already seen a widespread consensus emerging in areas where Canada is deemed to be at a disadvantage in northern science and research.

For example, Canada lacks an effective mechanism to increase research capacity in the North and to enable northerners to use modern technology in their information and decision-making systems.

Secondly, Canada does not have a national lobby body to coordinate and undertake arctic research, to determine research priorities on a national rather than an institutional basis, or to garner support for the most promising or most needed research.

Thirdly, no academy or similar body exists that can coordinate Canadian participation in international polar scientific activities.

These points, important to Canada, are unfortunately rarely addressed in government policy or political science research.

Ladies and gentlemen, I am confident that a National Polar Institute could address some if not most of these issues.

It could enter into cooperative agreements with other circumpolar countries on scientific research, environmental protection, navigation and industrialization.

However, I am determined that any new initiative does not lessen the effectiveness of the many good institutions and programs already in place.

I understand that, Dr. Tremblay, your Association will be discussing this idea as well as others in the course of your annual meeting. The Institute could serve as a tangible expression of Canada's identity and outlook as a polar nation. I urge you to give it the careful consideration it deserves.

All of us will face challenges in the North in the coming years. I believe that the major challenge for scientists and educators will be to identify opportunities and develop appropriate means and technologies for northern concerns.

Local needs make it desirable that research, technological development and pilot projects on the North be undertaken in the Canadian North. Even though some techniques already exist, perhaps they can be improved.

This is already happening in Alaska, where small research projects have been undertaken with limited funding to develop, for example, emergency solar power for boats.

In Canada, southern expertise could be applied to developing northern technology on sea-ice surveillance, human and animal medicine, solar energy, low-temperature construction techniques, water supply systems . . . the list goes on and on.

vés et cette façon de procéder est fort bien accueillie par le gouvernement qui croit en l'initiative du secteur privé. La Fiduciaire constitue d'ailleurs un complément au Programme de formation scientifique dans le Nord de mon ministère.

Je voudrais aussi féliciter votre organisme pour les efforts qu'il consacre à accroître le rôle des Inuit, des Dénés et des Métis dans le domaine de la recherche appliquée. Aujourd'hui, on effectue de plus en plus de recherche sur des questions identifiées par les autochtones eux-mêmes, et je crois qu'il s'agit-là d'un pas important.

L'Association universitaire canadienne d'études nordiques se situe dans le courant du travail scientifique et éducationnel qui s'effectue aujourd'hui dans le Nord. C'est pourquoi elle reçoit annuellement de mon ministère un financement de base de 180 000 $. À mon avis, cet appui constitue un bon investissement.

C'est pourquoi j'ai demandé à votre directeur exécutif, le Professeur Peter Adams, de se joindre à un groupe de travail qui étudie le besoin d'un institut polaire national. Je profite de l'occasion pour remercier le professeur Adams, les Messieurs Fred Roots, Peter Burnet et Mark Gordon pour l'excellent travail qu'ils ont effectué à ce jour en étudiant la faisabilité de la mise sur pied d'un institut polaire pour le Canada.

Le rapport provisoire que j'ai reçu, le 17 mars, montre que les membres du groupe de travail ont été fort occupés. En effet, ils ont fait parvenir quelque 800 lettres, dans lesquelles ils demandaient des commentaires et des suggestions aux gouvernements, au monde universitaire, aux groupes d'autochtones et aux collectivités locales, ainsi qu'aux organismes, industries et groupes d'intérêt public du Nord. De même, ils ont communiqué avec des organismes intéressés aux États-Unis, en Suède et au Danemark.

Le Groupe de travail a déjà constaté l'émergence d'un consensus dans des domaines où l'on estime que le Canada est défavorisé en matière de science et de recherche nordique.

Par exemple, il manque au Canada un mécanisme efficace permettant d'accroître la capacité de recherche sur le Nord et de permettre aux habitants du Nord d'utiliser la technologie moderne pour leurs systèmes d'information et de prise de décision.

En deuxième lieu, le Canada ne dispose pas d'un organisme national apte à coordonner et entreprendre la recherche dans l'Arctique, à déterminer les priorités de recherche sur une base nationale plutôt qu'institutionnelle ou à trouver des appuis pour la recherche la plus nécessaire ou la plus prometteuse.

En troisième lieu, il n'existe aucune académie ou aucun organisme semblable qui puisse coordonner la participation canadienne aux activités scientifiques polaires internationales.

Il est malheureux de noter que ces points, qui sont importants pour le Canada, sont rarement abordés dans les politiques gouvernementales ou les recherches en science politique.

J'ai la conviction, Mesdames et Messieurs, qu'un institut

What all this adds up to is a very exciting time for your organization in the coming years. As the federal minister responsible for the North, I am backing you one hundred per cent.

Thank you.

Note

Information on the Canada-U.S.S.R. Science Exchange Program can be obtained from Walter Slipchenko, Circumpolar and Scientific Affairs. Department of Indian and Northern Affairs, Ottawa, Canada K1A 0H4, telephone (819) 997-9595. Information on the Northern Scientific Training Program can be obtained from Harald Finkler, Circumpolar and Scientific Affairs, Department of Indian and Northern Affairs, Ottawa, Canada K1A 0H4, telephone (819) 997-9666. The current President of the Inuit Circumpolar Conference is Mary Simon, Box 280, Kuujjuaq. Quebec J0M 1C0. The full reference of the report of the Federal Task Force on Comprehensive Claims is *Living Treaties: Lasting Agreements*, Report of the Task Force to Review Comprehensive Claims Policy, Department of Indian and Northern Affairs, Ottawa, Canada, December 1985. The report of the Task Force on a National Polar Institute will be delivered to the Minister late in 1986 (ed).

polaire national pourrait aborder certaines de ces questions sinon toutes.

Un tel institut pourrait conclure des accords de coopération avec d'autres pays circumpolaires en matière de recherche scientifique, de protection environnementale, de navigation et d'industrialisation.

J'ai toutefois la ferme intention de veiller à ce qu'aucune nouvelle initiative ne vienne saper l'efficacité des nombreux bons programmes et institutions déjà établis.

Je crois savoir, professeur Tremblay, que votre association discutera de cette idée et de bien d'autres lors de votre réunion annuelle. L'institut pourrait servir à faire valoir, de façon tangible, l'identité et la perspective du Canada à titre de nation polaire. Aussi, je vous incite à donner à ce projet l'attention qu'il mérite.

Chacun d'entre nous fera face à des défis dans le Nord durant les prochaines années. Et, à mon avis, le principal défi qu'auront à relever les scientifiques et les éducateurs sera d'identifier les possibilités de développer les technologies et les moyens appropriés pour s'attaquer aux questions du Nord.

À la lumière des besoins locaux, il est souhaitable que la recherche, le développement technologique et les projets pilotes relatifs au Nord soient entrepris dans le Nord canadien. Certaines techniques existent déjà, bien entendu, mais il faudrait peut-être les améliorer.

C'est ce que l'on fait déjà en Alaska où des projets de recherche de petite envergure et à financement limité ont été entrepris en vue de développer, par exemple, une énergie solaire d'urgence pour les bateaux.

Au Canada, les compétences acquises dans le Sud pourraient être appliquées au développement d'une technologie du Nord en matière de surveillance des mers et des glaces, de la médecine humaine et animale, de l'énergie solaire, des techniques de construction par basses températures, des réseaux d'approvisionnement en eau ... et ainsi de suite.

En somme, tout cela veut dire que votre organisme peut s'attendre à passer des moments palpitants durant les prochaines années. Et à titre de ministre fédéral responsable du Nord, je vous appuie à cent pour cent.

Merci beaucoup.

Note de la rédaction:

On peut obtenir des renseignements sur le Programme d'échanges scientifiques Canada-U.R.S.S. auprès de M. Walter Slipchenko, Affaires circumpolaires et scientifiques, Ministère des Affaires indiennes et du Nord, Ottawa, Ont. K1A 0H4 (n° de tél.: (819) 997-9595). Au sujet du Programme de formation scientifique dans le Nord, on peut s'informer auprès de M. Harald Finkler, Affaires circumpolaires et scientifiques, Ministère des Affaires indiennes et du Nord, Ottawa, Ont. K1A 0H4 (n° de tél.: (819) 997-9666). Le Président actuel de la Conférence circumpolaire inuit est Mme Mary Simon, Box 280, Kuujjuaq, Québec J0M 1C0. La description bibliographique du rapport du Groupe fédéral d'études des revendications globales est la suivante: *Traités en vigueur: ententes durables*, Rapport du Groupe d'étude de la politique des revendications globales, Ministère des Affaires indiennes et du Nord, Ottawa, Canada, décembre 1985. Le rapport du Groupe d'étude d'un Institut polaire national sera remis au Ministre vers la fin de 1986.

YUKON SCIENCE POLICY

The Hon. Tony Penikett,
Government House Leader with Andris Rode, *Science Advisor, Government of Yukon,*
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Foreword

The need for a Yukon Science Policy arose from this government's recognition of the global importance of science, research and technology as the prime movers of economic revival and socio-economic development. It has been estimated that as much as two-thirds of the recent economic growth in Canada has been attributed to technological change and there is every reason to believe that its influence will grow.

A Science Policy is a fundamental first step towards developing our indigenous scientific and technological capabilities and integrating these into the mainstream of the research activities of the national and international scientific communities.

Our Science Policy is a clear signal to the federal science organizations, the granting agencies, and the universities that we are preparing to take a more active role in determining the nature and scope of science in the Yukon. The goals of the policy include the eventual establishment of a "science presence" and infrastructure within the government to: a) attract the scientific projects and personnel, programs, and funds to help further the Yukon's socio-economic development; b) attract and promote science programs that can create new educational opportunities and incentives for Yukon students; and, c) strive for the establishment of a Yukon-based scientific resource centre, essentially independent from government and industry, that is capable of conducting sound research on northern issues as defined by northerners and their institutions.

We are in the very early stages of developing a strategy on how best to employ science and technology as tools of the economic engine. Our resource-based industries need innovative methods to reduce costs and to increase productivity if we are to maintain or increase our share of the market.

The development of new technically advanced industries must be encouraged wherever these match the natural advantages of the Yukon. For example, new methods of locating, processing and refining metal ores could revitalize marginal operations. Innovations in the chemical and bio-technological leaching of precious metals could radically change the face of our metal industry; and, recently, startling advances have been made in controlling the fertility and reproduction of fur-bearing animals in captivity. We need a Yukon-based science capability because it is important to know what others are doing and to judge whether their advances can be usefully applied at home.

The publication of a Yukon science policy will demonstrate to the Canadian science community that we have formulated clear and specific goals and objectives for the role of science and technology in territorial affairs. It will show that the Yukon is taking positive steps towards becoming a serious contender for the available research funds and scientific support services. It will serve notice that we are preparing the groundwork for the devolution of federal science programs and the associated regulatory functions of federal science departments.

A statement of policy in itself is only the beginning of our efforts to ensure that science and technological adaptation become components of our long term social and economic strategy. On the basis of this policy, specific actions will be taken to help us reap the benefits that science and technology can provide. Through the development of such activities and programs the Yukon will be able to look forward to the future with the confidence that it is capable of taking advantage of the limitless opportunities science and technology offer.

Tony Penikett, Government Leader, Yukon

Basic Principles

A Yukon Policy, like all other public policies, is based on the three basic objectives of society in general: a) cultural enrichment, b) economic growth, and c) public welfare.

a) The advancement of scientific knowledge can play an increasingly important role in moving towards the goal of cultural enrichment. It is often said that basic research is a purely curiosity-driven activity that has no practical purpose. Granted, a practical mission is not the primary objective of fundamental research but it does have a clear and definite purpose — scientific discovery and the advancement of knowledge. And that makes it an essential element of our cultural life and civilization.

b) Society's other interests in research and development centre around the two broad categories of the innovation process. The first of these is aimed at the market place and is more related to economic growth. It is the natural result of industrial research and development.

c) The second category of innovation is aimed at solving broad social problems such as health, crime, poverty, poor education, and pollution. Thus, innovation in the social sciences for the public welfare constitutes another major goal of research and development and therefore of science policy.

With these broad social goals in mind, we can make some general statements on the guiding principles for a Yukon Science Policy. The overall science policy goal for Yukon is the creation and development of an independent research organization and infrastructure that can:

1. Identify research gaps and opportunities; plan and manage the resulting scientific activities and programs; and, evaluate the results.

2. Encourage scientific activity and research that will effectively contribute to: a) the protection and enhancement of Yukon's superb and spectacular environment; b) the attainment of balanced development; and, c) the enhancement of the quality of life in the Yukon.
3. Create and maintain an intellectual environment that will attract, promote, and support scientists and academics from home and abroad.
4. Lead to the development of an indigenous scientific community.

Additional overall tasks of a Yukon Science Policy are:

1. To maintain an integrated network for scientific and technological information on what is happening in the Yukon and elsewhere;
2. To ensure that the Yukon scientific establishment is adequate relative to national and international developments in science and technology;
3. To provide a balanced supply of scientific manpower and facilities relative to Territorial requirements;
4. To ensure a proper balance between scientific disciplines; between pure research, mission-oriented research, and development work; between government, industry, and the universities as performers of research;
5. To prevent over-expansion in certain areas of research and development and to identify and fill significant gaps in others; and
6. To ensure co-ordination in the overlapping needs of government departments where multi-disciplinary and inter-departmental programs are essential.

Some Specific Objectives

The following statements of objectives are meant to provide direction to Government of Yukon science activities and programs in pursuing the overall policy goals and tasks as described above.

1. Strive for the establishment of a Yukon-based scientific resource centre, independent from the federal government and industry, and capable of conducting sound research on Northern issues as defined by Yukoners and their institutions. The creation and development of independent research facilities together with close links to other northern and polar research institutes is the key to the development of a capable Yukon-based science community.
2. Give priority to the active recruitment and training of interested Yukoners with the objective of supporting the establishment and maintenance of a strong Yukon-based science community. We should develop incentives and provide stable educational opportunities for students to train in and enter professional careers in science.
3. Ensure that government research programs and activities lead to levels of industrial and resource development that are ecologically sustainable, environmentally safe, socially acceptable, and economically sound. If balanced development is to be achieved, our science programs must keep pace with industrial activity. A much greater effort is needed in basic research on northern ecosystems and the socio-economic and environmental effects of industrial activity. Research, intelligence, and monitoring programs are also needed by both government and industry to allow timely responses to unforeseen impacts and developments.
4. Ensure the timely availability of science-based information for development and the accompanying environmental regulatory process. There is a need for an information centre to serve as a repository and clearing house of scientific information and to quickly and efficiently disseminate the results of research to the public.

   It is important that Yukoners have ready access to public information produced by the scientific community. Well-informed citizens and groups are a key element of the successful implementation of many public policies and programs. This can be done through original research, the establishment and maintenance of long-term data bases, through data acquisition links with Southern information networks, and the establishment of a Yukon-based scientific reference centre. Supporting conferences, symposia, seminars, workshops, and lectures are other excellent means of information dissemination. Encouraging organizers to convene such meetings in the Yukon can have additional benefits.
5. Increase the level of research to improve baseline data and the understanding of natural ecosystems, thus leading to a more effective management of our renewable resources and more balanced development. There is a need to establish and operate long-term research sites in relatively undisturbed areas of Yukon for uninterrupted monitoring of natural and man-made changes.

   The government's scientific data bases are frequently based on short-term impact studies, and there are not enough qualified scientific personnel within its ranks to interpret industry's research methods and conclusions. Too often, industry's data bases and interpretations are the only information available for government decision-making. The effectiveness of government planning (whether in the regulatory process, land-use, or development) is vitally dependent on ready access to unbiased and up-to-date information.
6. There are issues in science which require federal, provincial, territorial, or international cooperation and action. The most notable of these are the ones concerning river systems and fresh-water resources, migratory species, the marine environment, and air quality. It is particularly important that we cooperate with our Canadian and circumpolar neighbours in the development and exchange of scientific information needed to manage these emerging issues.
7. Ensure that government research programs and activities contribute effectively to the protection and enhancement of Yukon's spectacular and unspoiled environment. The welfare of every human being is vitally linked to the quality of the natural

environment, making this a very important and complex issue. The issues surrounding man-environment relationships and government response to them are particularly relevant in the Yukon. Here the relationships between environmental realities and human activities and welfare are very direct. As environmental quality deteriorates so do the social, physical, psychological, and economic indices of society's well-being. Northern ecosystems are particularly vulnerable and there is little leeway for error.

8. Increase the level of research in the social sciences to promote social innovation and to enable Yukoners to improve their welfare and the quality of their lives.

   The Canadian North has a social environment that is often classified as a frontier, a place with a less entrenched social establishment, where social mobility is easier to achieve, and where rapid socio-economic changes create significant upheavals in the social order.

   The unacceptably high rates of suicide, homicide, accidents, alcoholism, abuse, and unemployment among northerners are all indicative of a highly stressed society. The traditional modes of adaptation are clearly no longer adequate and the newly emerging modes are but poorly understood.

   These problems have reached epidemic proportions in the North. There is an urgent need for fundamental research in the social sciences to uncover the roots of these problems and, more importantly, to find acceptable solutions.

9. We need a cooperative research strategy involving all sectors of the research establishment operating in the Territory. The fragmentary and independent approach of past projects will, of necessity, be replaced by more coordinated research efforts. Effective coordination can prevent duplication, increase efficiency, and facilitate exchanges and transfers of data and information between government, industry, and academic organizations and scientists. The successful solution of an ever increasing proportion of research problems is dependent on a multidisciplinary or interdisciplinary approach, making the role of coordination that much more important.

10. There has been insufficient emphasis on the role of economics in interdisciplinary research regarding energy and mineral development, renewable resources, and transportation systems. It is difficult to apply conventional theories of economic development to Northern situations because little is known of the unique problems of developing vast, remote, and sparsely settled regions. The natural environment is harsh and precarious, and physical access is limited by environment, technology and cost.

    There is a need for a careful re-examination of our development experiences with past "boom and bust" projects. Objective cost-benefit analyses are needed to clarify the real costs of these projects to society. We should weigh the immediate and obvious benefits of resource development (employment, increased economic activity, etc.) against the ultimate costs to society (social upheavals, pollution, environmental damage, etc.).

    We must also find means of evaluating the economic worth of Yukon's wildlife, spectacular scenery, and superb recreational opportunities. The final net worth of these amenities may be many times greater than the short-term benefits of resource development. Economic research and analysis are needed to clarify the relative and long-term merits of investing in resource development versus banking on Yukon's recreational and tourism potential. Standard economic analyses are not applicable to measuring the true value of these amenities. More interdisciplinary research is needed to develop new techniques for evaluating their worth to society in the real terms acceptable to policy makers, planners, and developers.

11. Strive to ensure, whenever possible and/or practical, that government research programs and scientific activities support and complement the science programs provided by the Territorial school system. We should endeavour to provide the educational opportunities and incentives to encourage careers and provide the manpower needed to Northern science and engineering.

Some of the ideas and concepts found in this document have been used in other places, at other times, and for different purposes. We respectfully acknowledge our indebtedness to the public servants and scientists who have shown us the way. While we cannot claim total originality, we readily accept the challenge of implementing these ideas under our unique Northern conditions and circumstances. A Yukon Science Policy is a first step towards creating and developing a science presence and infrastructure in the Territory.

To that end, all of our options are open. We can learn from the mistakes of the scientifically more advanced regions of Canada, and we have the enviable opportunity of doing things right.

Note

Mr. Penikett was unable to attend the Yellowknife meetings. This material was presented, on his behalf, by Dr. Rode (ed).

YUKON — SOME RECENT DEVELOPMENTS IN HIGHER EDUCATION AND RESEARCH

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My purpose here is to provide an overview of federal-territorial progress and plans for a Yukon Science Centre and the concurrent efforts to develop a science presence and infrastructure within the Yukon government.

As far back as 1969 the Department of Indian Affairs and Northern Development (DIAND) first identified the Yukon as an area of the Canadian North in need of scientific support facilities. In 1975 plans were made to establish such a facility in Whitehorse and in 1979 the department prepared a treasury board submission for the project; however, the submission was withheld due to a spending freeze.

Nevertheless, interest in the proposal continued to grow and in 1983-84 DIAND explored the feasibility of re-activating the project. It was shown that six other federal government departments had specific requirements for laboratory space and research facilities. DIAND itself had pressing requirements in order to fulfill its operational responsibilities in the Yukon region. The Ministry of State for Science and Technology was also very interested in the proposal and believed that it should receive serious consideration. The Association of Canadian Universities for Northern Studies also supported the proposal. Mr. Penikett, the Government Leader today, and his cabinet also endorse the project as have all Yukon governments since 1974. Momentum continued to build and the proposal now has the additional support-in-principle from the three federal cabinet ministers — The Honourables Erik Nielsen, David Crombie, and Frank Oberle.

The proposed Yukon Science Centre, like its N.W.T. counterparts, would be part of an integrated scientific support system in the Yukon that would serve visiting scientists from Canada and abroad. But it would also be much more than that. It would contain dedicated facilities to meet the science-based operational requirements of a number of territorial and federal government departments. These would include, for example, the laboratory requirements of the Yukon Renewable Resources branch, the needs of the Water Resources Division of DIAND, Forestry, Geology and others. It is anticipated that such dedicated facilities could account for 50-75% of the space requirements in the centre, depending on the needs as determined by the pre-design studies. This arrangement has a number of advantages. The year-around use of the facility by scientists and technicians from a variety of disciplines would be an invaluable resource to visiting scientists. The long-term baseline data that they would be compiling would also be a most useful bench mark for visitors seeking comparisons for their short-term studies. Equally important, the data would be readily available and at one location. Furthermore, the year-around use of the centre would practically eliminate the problems faced by northern research support facilities that are primarily dependent on the seasonal influx of visiting scientists.

The centre would also have a strong public component serving the needs of Yukoners, independent researchers, and private research organizations such as the Yukon Science Institute.

One of the most exciting aspects of this proposal is our plan to make the proposed Yukon Science Centre an integral part of the new Yukon College. Yukon College was established in March 1983 by the amalgamation of the Yukon Vocational and Technical Training Centre and the Yukon Teacher Education Program to provide comprehensive post-secondary educational services to Yukon. Its primary purpose is to provide a broad range of educational opportunities, particularly in the fields of academic development, business and applied arts, trades and technology, university transfer, and human skills development. Over the next four years the college will be relocated to a new $40 million campus. The first building will be erected during the summer of 1986. The new college has been designed as a complex of five interconnected modular buildings which include a student residence and a community activity wing complete with theatre and gymnasium.

The proposed Science Centre would be one element of that complex. Not only does this plan make economic sense and good use of scarce resources, but it will also benefit both institutions in a number of interesting and productive ways. First, the design, construction, and maintenance costs of a science centre as a physical part of the Yukon College will be substantially lower than those of an independent centre at some other location. Second, a considerable range of facilities can be shared by the two institutions: — library and reference centre, lecture and meeting rooms, certain laboratories, and other specialized facilities and services. Other possibilities for co-operation include cross-appointments whereby a visiting scientist conducting research at the centre could also act as guest lecturer at the college. Good research facilities at the centre together with the establishment of a "visiting professorship or chair" at the college could prove to be the incentive needed to attract southern scientists to the Yukon for periods of a year or more rather than for the customary summer months. The permanent scientific staff engaged in operational research at the centre could also be a valuable source of expertise and help both to visiting scientists and to the college staff and students.

The proposed Yukon Science Centre and its relationship to the new Yukon College is but one element of an overall science and technology strategy for the Yukon. Over the last 8 months we have been working towards the establishment of a territorial research organization within the Yukon government. As a first step in that process we have developed a *Science Policy for Yukon*. While we *are* working towards a higher Yukon profile in the scientific community, we are fully aware that visiting scientists and science support from the south have been the cornerstone of northern science to date and will continue to be so for some time to come. It is therefore very important that the Yukon institute and develop policies, mechanisms, and facilities that will attract them to the territory. It is equally important that Yukon take the leading role in those areas of science and technology that can have a direct effect on life and developments in the territory. The creation of a Yukon science policy is an important first step in that process. Our Cabinet has approved and accepted the policy and it was tabled in the Yukon legislature on April 1, 1986, see preceding article.

ACUNS AND THE NORTH WELCOMING ADDRESS TO ACUNS CONFERENCE ON HIGHER EDUCATION AND RESEARCH IN THE NORTH, YELLOWKNIFE, N.W.T., APRIL 1986

L'AUCEN et le NORD — Allocution de bienvenue à la CONFÉRENCE sur l'enseignement supérieur et la recherche dans le NORD en avril 1986 à YELLOWKNIFE, T.N.-O.

Marc-Adélard Tremblay, President

Département d'anthropologie, Université Laval, Sainte-Foy, Québec G1K 7P4, (418) 656-3775

It is my pleasure and privilege to welcome you to our annual meetings which are devoted this year to the theme HIGHER EDUCATION AND RESEARCH IN THE NORTH.

Before proceeding to the formal program, I would like to take the opportunity to tell you something about ACUNS and about these meetings.

In some ways ACUNS is a very small organization, in others it is very large.

It is small in that we have a very small secretariat. We maintain an office in Ottawa with a permanent staff of only two. Most of the work of the Association is conducted through the volunteer efforts of its Board and Committees.

In other ways, ACUNS is a very large organization. After almost ten years of existence, we have no fewer than thirty-five member universities from across Canada. These universities between them represent hundreds of thousands of students and faculty.

Each university has a northern organization of some sort. In some cases the organization is simply a committee which coordinates teaching and research on the North. In others, the organization is a major institute or centre.

Thus, for example, the University of Calgary is represented in ACUNS by THE ARCTIC INSTITUTE

J'ai le plaisir de vous accueillir à notre Conférence annuelle qui, cette année, portera sur le thème de l'ENSEIGNEMENT SUPÉRIEUR ET LA RECHERCHE DANS LE NORD.

Avant d'entamer l'ordre du jour, je vais profiter de l'occasion pour vous fournir quelques renseignements au sujet de l'AUCEN et de la présente Rencontre.

Si l'Association semble plutôt petite quand on considère l'équipe qui l'anime, de certains autres côtés elle apparaît considérable.

Elle est petite, car son secrétariat est très réduit. Elle maintient un bureau à Ottawa, et son personnel permanent ne comprend que deux personnes. La plupart des activités de l'Association sont animées par son conseil d'administration et ses comités, dont les membres agissent à titre bénévole.

Par contre, par sa composition, l'Association a beaucoup d'envergure. Après une dizaine d'années d'existence, elle ne comprend pas moins de trent-cinq universités membres, dans toutes les régions du Canada. Les étudiants et les membres du corps enseignant de ces universités sont des centaines de milliers.

Chacune d'entre elles dispose d'un organisme nordique dont la nature est diverse. Dans certains cas, il s'agit simplement d'un comité qui coordonne les études et la

OF NORTH AMERICA, Université Laval is represented by LE CENTRE D'ÉTUDES NORDIQUES, the University of Alberta is represented by THE BOREAL INSTITUTE, our representative from Memorial University is the Executive Director of THE LABRADOR INSTITUTE OF NORTHERN STUDIES. And so on.

In all, our universities contain some 600 faculty members who have polar interests. We estimate that each year more than 600 students study in the North — that is in the Territories and north of the Provinces. Tens of thousands of students take courses which involve the North.

Officially, the purpose of ACUNS is

> "THE ADVANCEMENT OF NORTHERN SCHOLARSHIP THROUGH EDUCATION, PROFESSIONAL AND SCIENTIFIC TRAINING AND RESEARCH"

We carry out our mission through a major scholarship program, by maintaining an information network and by organizing conferences, such as this, on important themes. As an example of this work, you may be interested to know that we have given away almost $200,000 in scholarships during the last two years. Virtually all of this money was raised from the private sector. The scholarships include a program of Special Awards for Northern Residents.

In addition to this privately funded scholarship program, we operate another involving a further $100,000 specifically for native students.

In the area of conferences, ACUNS has sponsored meetings on renewable resources, arctic heritage, the role of women in northern society and other topics. In 1986, in addition to this conference, we will be organizing a National Student Conference on Northern Studies and a meeting of four subarctic universities.

Here in Yellowknife our focus is HIGHER EDUCATION AND RESEARCH IN THE NORTH.

The idea is that these meetings will be a sort of "mutual briefing" between the universities and the people and organizations of the North. The universities have come to Yellowknife to hear first hand about current activity and needs in education and research in the North. At the same time we hope to provide the people of the North with a clear idea of the scope and potential of our extremely diverse member universities. You already have in your delegate kits the start of a set of profiles of our universities which we hope will be of lasting value to people in the North interested in education and research. (These form the last Section of this volume, ed.).

The published Proceedings of these meetings will raise awareness, in Canada and abroad, of what is being done by groups in the North.

Although all of our member universities work in the North, this is only the second time that ACUNS has held its annual meetings in the North. Our other seven meetings were in the south largely for financial reasons. We hope that in future we will be able to raise the funds to meet in the North more frequently.

In conclusion, I would like to thank the Government of

recherche nordiques. Dans d'autre, c'est un grand institut ou un centre spécialisé.

Ainsi l'Université de Calgary est-elle représentée au sein de l'AUCEN par THE ARCTIC INSTITUTE OF NORTH AMERICA, l'Université Laval par le CENTRE D'ÉTUDES NORDIQUES et l'Université de l'Alberta par THE BOREAL INSTITUTE; le délégué de l'Université Mémorial auprès de l'Association est le Directeur général du LABRADOR INSTITUTE OF NORTHERN STUDIES, etc.

Dans l'ensemble, nos universités membres comptent 600 professeurs s'intéressant aux questions polaires. Nous estimons que, d'autre part, 600 étudiants s'instruisent dans le Nord, c'est-à-dire dans les Territoires et dans les parties septentrionales des Provinces. Des dizaines de milliers d'étudiants suivent des cours portant sur le Nord.

Le mandat officiel de l'AUCEN est de promouvoir

> "LE PROGRÈS DES CONNAISSANCES NORDIQUES PAR L'ENSEIGNEMENT, LA FORMATION PROFESSIONNELLE ET SCIENTIFIQUE, ET LA RECHERCHE".

L'AUCEN mène à bien sa mission grâce à un grand Programme de bourses d'études, au maintien d'un réseau d'information et à l'organisation des conférences (telle la présente Rencontre) portant sur des thèmes importants. Par exemple, cela vous intéressera peut-être d'apprendre qu'au cours des deux dernières années, l'Association a réparti des bourses d'études pour un montant d'environ 200 000 dollars. La quasi-totalité de cet argent a été recueilli auprès du secteur privé. Il a aussi financé un programme de bourses spéciales pour les Nord-Canadiens.

En plus de ce Programme de bourses d'études financé par des fonds privés, l'Association en administre un autre qui lui permet de répartir 100 000 dollars entre les étudiants autochtones.

Parmi les rencontres qu'elle organise, l'AUCEN a parrainé des conférences sur les ressources renouvelables, le patrimoine de l'Arctique, le rôle des femmes dans la société nordique, l'enseignement et la recherche dans le Nord, et d'autres thèmes. En 1986, en plus de cette conférence, nous mettrons sur pied une Conférence nationale des étudiants en Études nordiques et une Rencontre des quatre universités à vocation subarctique.

Le thème principal de notre Rencontre ici, à Yellowknife, est l'ENSEIGNEMENT SUPÉRIEUR ET LA RECHERCHE DANS LE NORD.

Il s'agit de faire de cette Rencontre une sorte de "mise au courant réciproque" des universités, des organismes et des personnes du Nord canadien. Les représentants des universités sont venus ici pour connaître de première main quelles sont les activités actuelles et les besoins de l'enseignement et de la recherche dans le Nord. Parallèlement, nous espérons donner aux Nord-Canadiens une bonne connaissance des objectifs de l'éventail très diversifié de nos universités membres, et des possibilités qu'elles offrent. Vous avez déjà trouvé dans votre documentation de délégué les éléments d'un exposé descriptif sur chacune d'entre elles, et nous espérons que cette information sera d'une utilité durable pour les

the Northwest Territories and other organizations in the North as well as the Department of Indian Affairs and Northern Development for their assistance in the initiation and organization of this conference. We are particularly grateful to the Ministry of Education of the N.W.T. and its Minister, the Hon. Dennis Patterson, for their enormous assistance. I can honestly say that without this help these meetings would not have been possible.

Ladies and gentlemen, it is a pleasure for me on behalf of the Association of Canadian Universities for Northern Studies to welcome you to this conference.

Note: A list of ACUNS' principal publications follows (ed.)

personnes qui, dans le Nord, s'intéressent à l'enseignement et à la recherche. (Note de la rédaction: ces renseignements sont rassemblés dans la dernière section du présent volume).

La publication du Compte-rendu de cette Rencontre montrera, tant au Canada qu'à l'étranger, l'ampleur de ce qui est accompli collectivement dans le Nord de notre pays.

Bien que toutes nos universités membres oeuvrent dans le Nord, c'est la seconde fois seulement que l'AUCEN y tient son Assemblée annuelle. Nos sept autres réunions se sont déroulées dans le sud du Canada, surtout à cause de raisons pécuniaires. Nous espérons qu'à l'avenir l'Association disposera de fonds suffisants pour que ces réunions y aient lieu plus souvent.

Pour conclure, je remercie le gouvernement des Territoires du Nord-Ouest et les autres organismes nordiques, ainsi que le ministère des Affaires indiennes et du Nord canadien, pour l'aide qu'ils ont accordée lors du lancement et de l'organisation de cette Conférence. L'Association est particulièrement reconnaissante à l'égard du ministère de l'Éducation des T.N.-O. et de son chef, l'honorable Dennis Patterson, pour leur soutien inébranlable. Sans ce soutien, je peux en vérité dire que cette Rencontre n'aurait pas pu se dérouler.

Mesdames et Messieurs, au nom de l'Association universitaire canadienne d'Études nordiques, j'ai le plaisir de déclarer ouverte la Conférence.

(Note de la rédaction: une liste des principales publications de l'AUCEN figure ci-après).

ACUNS PUBLICATIONS/PUBLICATIONS DE L'AUCEN

The Use of Greenlandic and Danish in Greenland Schools (1950-1978), 1980

Some Thoughts on the Current State of Teaching and Research about Northern Canada, T.H.B. Symons, 1980 (out of print).

Proceedings of the First International Symposium on Renewable Resources and the Economy of the North, 1981, M.M.R. Freeman (ed.) (out of print).

Ethical Principles for the Conduct of Research in the North/Principes d'éthique pour la conduite de la recherche dans le Nord (also available in Inuktitut), 1982.

List of Northern Specialists at Canadian Universities/Liste des spécialistes du Nord dans les universités canadiennes, 1983.

Resources and Dynamics of the Boreal Zone: Proceedings of a Conference held at Thunder Bay, Ontario, August 23-26, 1982, R.W. Wein, R.R. Riewe, I.R. Methven (eds.), 1983.

Social Science in the North, Communicating Northern Values, 1984.

Federal Government Resources for University Research and Science Training in the North/Ressources du gouvernement fédéral pour la recherche et la formation scientifique dans le Nord, 1984.

Guide to Northern Science Licences and Permits,/Recherche Nordique — Répertoire des licences et permis, 1984.

Distance Education in the Canadian North: An Annotated Bibliography, 1984.

Report of Seventh Annual Conference, includes papers on Issues in Northern Health, 1984.

Northern Engineering: Organization and Policy with Report of the 1985 Conference, 1985.

Canada's Northern Stations, 1986.

Arctic Heritage, Proceedings of a Symposium, 1987.

Education, Research, Information Systems and the North, 1987.

Northline/Point Nord — quarterly newsletter

Forthcoming, Proceedings of a Conference of Subarctic Universities of Canada and of the first National Student Conference on Northern Studies.

EDUCATION AND RESEARCH AND THE NORTH

EDUCATION AND RESEARCH AND THE NORTH

ACUNS has thirty-five member universities each of which is devoted to "education and research". The 'northern' activities of each of these institutions is but one small part of the ongoing life of the university. Except for particular purposes (such as administrative convenience), most people in the university community would argue that 'education' and 'research' are very closely related, if not inseparable. Thus, when we were asked to address 'education and research' in the meetings upon which this volume is based, there was a good deal of debate about how we might most usefully divide up the discussions and presentations so as to best develop the 'mutual briefing' (between the North and the Universities) which the meetings were intended to be.

In the event, we established workshops on 'Higher Education and Training', 'Teacher Education' and 'Distance Education' (which provided the bases for major Sections in this volume) and we called the core of the conference 'Education and Research' providing the basis for this Section. This part of the meetings took the form of an exciting exchange of views between 'North' and 'South', the papers which follow are the hard copy products of that exchange.

We regret that we do not have a paper from Ely Panipakoocho who made a presentation on the Arctic Research Establishment at Pond Inlet. A report on this work can be found in *Northern Engineering: Organization and Policy with Report of the 1985 Conference* (ACUNS 1985). We also regret that we do not have a written version of the fine presentation which was made by Susan Enge, President of the Native Women's Association of the N.W.T.

The Section is roughly divided into two parts. The first ("... mainly Education") consists of papers which tend to focus on elementary or high school education and concerns about the way in which universities and colleges receive graduates of the northern school systems. The second part ("... mainly research") contains presentations by northerners and southerners which focus more on research, research needs and research organizations.

It was very clear from the conference presentations that the people and organizations of the North, like the universities, do not draw a clear line between 'research' and 'education'! A concrete example of this, contained in the paper by Bielawski, is the work of the Northern Heritage Society in placing northern high school students in research projects. This results in an educational experience which has real benefits for the research concerned. It is equally clear that groups as diverse as the Science Institute of the N.W.T., Makivik Corporation and the Dene Nation (articles by Janes, Kemp and Barnaby, respectively) see research in the North and education in the North as being inextricably interrelated. The Dene Nation's views are further elaborated in the Information Systems Section of this volume (see article by Abel). The Makivik paper is a particularly interesting discussion of "traditional, cooperative and appropriate" science in the North.

At the ACUNS meetings in Yellowknife, a number of people suggested that communities, organizations or even individuals in the North might maintain 'wish lists' of research projects which university professors or students considering research projects might consult. This suggestion is particularly well articulated in the article by Doherty who already produced such a list for distribution by ACUNS. This is an exercise which, although not as easy as it sounds at first hearing, might be well worth following up. ACUNS is willing to play a facilitating role.

We are also trying to follow up other suggestions made at the meetings and contained in these articles. We have, for example, widely circulated suggestions (article by Cronk) for the reception of female students from the North by the universities. This volume itself is intended as a means of widely advertising the needs and recommendations expressed in Yellowknife.

We would point out that all of the other Sections of this volume could have been included under 'Education and Research'. We urge readers to consult them.

By way of conclusion, we take the liberty of reprinting, with permission, a note by Gordon Hodgson, Editor of *Arctic*, the Journal of the Arctic Institute of North America (Vol. 39, No. 1, p. 1, 1986). This is the world's leading multidisciplinary arctic journal. In the note, Hodgson is addressing readers of his journal on the occasion of its 40th Anniversary. We print the piece in its entirety here partly because it gives some idea of the strength and continuity of Canada's involvement in Northern Studies but mainly because it brings out the special responsibility which the academic community has for the North and the great obligation which 'Northern Scholars' have towards the North. The emphases are ours.

"Into The Next Forty Years

Long-term readers of *Arctic* know that the Arctic Institute of North America (AINA) has completed 40 years of existence, and as *Arctic* enters its 39th volume it is undergoing a facelift that we hope will be reassuring to our readers. There are other more subtle changes that we hope will make a good journal better. Some of these are in response to suggestions from readers, suggestions for which we are always grateful.

The North is changing, and we will try to keep up! But it will take a good deal more than cosmetic changes. AINA was founded in the aftermath of the last world war to serve as a respository of northern data collected during wartime, and more importantly to serve as a vehicle for peacetime research and scholarship in the North.

Wartime science was principally data gathering in the hard sciences and technologies. During much of the first 40 years the tradition of hard science prevailed, although the original purposes of AINA in Canada included social and political matters in the North. Nevertheless the funding for research and study during those 40 years lay largely in the physical and life sciences. The editorial content of *Arctic* reflected this focus.

Clearly, profound changes are occurring in the North, and the reality of these changes is penetrating the academic community as never before. But it takes a while for the funding of northern research to recognize the new realities. To maintain some element of currency in the pages of *Arctic*, we are trying to shift the editorial focus to include significant numbers of research papers on sovereignty, native government, renewable resource management, communications, international militarism, housing, linguistics, government, and all those other topics of prime concern at this time in the Arctic both in Canada and beyond.

These topics are on the front page of every publication coming out of the Arctic, and while *Arctic* (and *Information North*) are not newspapers, we still have a responsibility to be as current as we can in our particular mode of publication. One of our problems is that we have a backlog of excellent manuscripts still waiting in line for publication, and the bottom-line constraint is always limited funding.

We must take care to keep up with the times in all ways. In these days of staggering new possibilities in electronic communications, we must not overlook uniquely important new technologies. For example, it seemed incongruous to this new editor that a manuscript written today may spend the next 12 to 18 months in review and revision and, finally, the physical process of publication. True, some make it through the system more quickly, but why should it even take six months? Why not six weeks, six days, six hours or even six minutes?

Such questions raise the more fundamental question of the purpose of publishing research results. *Arctic* is proud to be a member of a distinguished population of scholarly journals. Scholarly journals have been around since the beginning of time — even before the establishment of the Arctic Institute — and they serve their authors and readers well in completing the process of discovery and learning. The printed word is a durable vehicle of communication, and it will be with us forever.

But we must not stop there! If we agree that discovery and learning extend into the publication process and that new technologies may speed up the steps in publication, *Arctic* should be exploring means by which the new technologies may be applied in the coming decade. We can follow the obvious approaches of using electronic data transmission for manuscripts between author, editorial offices, typesetter and printer. Then we can develop on-line full-text availability for readers as well as on-line abstracting.

The biggest delays, however, lie in review and revision, and it is here that the greatest innovation may be practiced. The processes of review and revision are more complex and much more positive than commonly recognized. They include not only those steps taken after receipt by *Arctic* but a whole variety of steps before that: many manuscripts are direct condensations of theses that have been written, rewritten, defended and revised under abundant authoritative criticism. Some were presented at conferences and revised as a result. Some manuscripts are condensed consultants' reports that too were extensively revised. Other manuscripts come from professional work in regular institutional research. Still others come from excited bootlegged research!

Perhaps there is a role for *Arctic* to play in facilitating a total review and revision process by promoting an innovative system in which evolving manuscripts are presented in an electronic network. The principles of teleconferencing and electronic bulletin-boarding appear to be applicable. We can assume that everyone involved in arctic scholarship has access to telephones and personal computers, and therefore is able to access such an arctic network of discovery and learning.

In most parts of the world academic work is largely isolated from the "real world," but this is not true in the Canadian North. Here, because the numbers of people are very small and the issues are so sweeping, the compartmentalization of other societies is not appropriate and does not occur. Thus, in the North the connection between classic research and the real world is much closer, and the more the focus of scholarship moves from traditional science toward issues of people — native government, communications, sovereignty and militarization — the more the academic information system overlaps with the real-world systems. Indeed, in a number of areas the conduct of research itself is carried out by native and local people.

It would seem to follow that *Arctic* could assist in establishing a new dimension in information management in the North by promoting an arctic network of discovery and learning, focussing on innovative processes of communication, exploration, criticism, revision and publication.

— Gordon W. Hodgson"

.... mainly Education

UNIVERSITY RESEARCH AND THE DENE NATION*, A SUMMARY OF A PRESENTATION AT THE ACUNS MEETINGS IN YELLOWKNIFE

Joanne Barnaby,
*Dene-Metis Negotiations Secretariat**
Box 1417, Yellowknife, N.W.T. X1A 2P1 (403) 920-2725

Thank you for inviting a representative of the Dene to address you. I am presently the Research Director of the Dene and Metis Negotiations Secretariat, the body responsible for comprehensive claims negotiations with the Federal Government.

The type of research carried out by the Secretariat varies considerably and ranges from Euro-Canadian legal-type research to traditional Dene institutional and social relationships, research and development. The objective of course is to produce proposals and, ultimately, agreements that will reflect Dene values and traditions while establishing equitable relationships with other Canadians through the negotiating process.

Prior to becoming a member of the Secretariat staff, I held the position of Director of the Dene Nation Land and Resources Department. In that capacity, I was responsible for seeking greater participation of the Dene in decisions regarding land and water use.

For the most part, this involved lobbying decision makers as our people are not recognized as having the right to make decisions regarding their own land. Much of our energy was focused on challenging the premise upon which decisions were made. We found that decisions regarding land use in our homeland were being made based on southern experience with little regard to the realities of our northern environment.

On numerous occasions we offered our knowledge and expertise in forums available to us. Consistently these attempts have failed because our expertise has been viewed more as political opinions rather than "scientifically sound fact".

Ironically the extremely limited knowledge of southern science in the north, which has rarely been tested, supercedes in the minds of many, the knowledge we possess through thousands of years of experience.

There is no attempt being made by governments or others to recognize, nurture and develop Dene science. I am fearful that one day we will find that it is too late. The intricate knowledge of our people and especially our elders is slowly being lost. A true opportunity for western science and for Canadian academia to expand and to benefit is also being lost.

I believe that as a member of that community you have an interest in insuring that this loss does not occur. Indeed you have a responsibility to declare your own incompetence and inadequacy in the decision making process that will , if not changed, alter the face of the North forever. The results of your work after all are used to justify decisions made in the North, decisions that are presently following patterns set in the South... patterns that have led to major environmental destruction around the world.

On a more positive note, you have much to gain by promoting the recognition and development of Dene science, whether this be in the ecological area or in human sciences. We share with you, after all, the deep rooted desire to understand the environment around us so that we may protect it for generations to come, while maturing our relationships among people.

I have hopes that one day we will have in place the tools and recognition necessary to keep our science alive. I ask you for your support in meeting this objective.

* In 1964, the Indian Brotherhood of the N.W.T. was formed. This was a political organization of the Treaty Indians of the Dogrib, Chipewyan, Southern Slavey, Northern Slavey and Loucheux. The organization began researching Treaties #8 and #11, which involve these five tribes. In 1975, the tribes declared themselves to be a nation within Canada with a right to self determination and changed the name of the Brotherhood to Dene Nation. At that time, a formal land claims negotiations team was formed.

Note

A report on Joanne Barnaby's powerful presentation appeared in *Native Press*, April 25, 1986, p. 3 (ed).

THE NORTHERN HERITAGE SOCIETY: A CASE STUDY IN DEVELOPING SCIENCE WITH NORTHERNERS

E. Bielawski

Northern Heritage Society, P.O. Box 475, Yellowknife, N.W.T., X1A 2N4 (403) 873-6582

Introduction

Research and education leading to employment in research activities are still primarily conducted by professionals based in the South. The Northern Heritage Society, however, based in Yellowknife, is an independent, non-profit organization devoted to research, education and training with and for northerners. In the previous paper, (Bielawski, 1984, reprinted in this volume) I briefly described the Northern Cultural Heritage Project. It is worthwhile, indeed necessary, to review the evolution of that project into the Northern Heritage Society of 1986. It is necessary, because the history, growth and activities of the Society (hereafter referred to as NHS) illustrate the social climate for science in the North.

NHS

NHS is unique. It was founded by individuals, researchers deeply committed to involving northerners in research, education and training, as well as to conducting research of the highest quality. Its first project, an archaeological field school in the High Arctic was so successful that the founders formed the non-profit society in order to continue and develop the programme and related projects. NHS was not established through legislation nor mandate. Contrary to the belief of many, it is not a government agency, nor a programme of the Northwest Territories museum (Prince of Wales Northern Heritage Centre). It is also not a native organization. It is not a high school or university organization. It does not have core funding, nor has a single year of its six-year existence passed without a financial crisis. NHS falls between the definitions of recognized agencies such as the government, university research institutes, native organizations, cultural programmes, and educational institutions.

Why are the composition and history of NHS significant? Because NHS' success results from its singular commitment to research and education with and for northerners. No other organization gives this objective priority. A corollary to NHS' success is its failure to procure core funding, and hence to insure its continuation and growth. Yet, the call for northerners to become involved in scientific activities grows louder annually. The NHS came in to existence precisely because no other agency was struggling with the nuts and bolts implied in "getting northerners involved." Those of you who have, will recall the tremendous personal commitment that good teaching and training require, and recognize the thousandfold increase in energy required to bridge the distance between cultures at the same time. This is the work of NHS.

How is it accomplished? At present, NHS operates two major projects. These are the Northern Heritage Research Project (NHRP) and the Arctic Science Assistant Programme (ASAP). These have grown out of the original Northern Cultural Heritage Project (Bielawski 1984). NHS is maintained by a growing staff and numerous volunteers. The 55 graduates of the field programmes are voting members of NHS, which is incorporated under the Societies ordinance of the Northwest Territories. One graduate is a staff member. Nine have found employment with other research teams for the 1986 field season, as have several others in previous years. NHS requires $200,000 annually, and only insufficient funds limit the number of northern, native participants in research projects.

The Northern Heritage Research Project (NHRP)

This program began as an archaeological field school. It has since expanded to include ecology and earth science components. The student experience stems directly from the research being conducted. Thus students learn specific skills for collecting scientific data in the field, and receive general education in three disciplines. More disciplines can be included in the project if researchers and funders commit themselves to it.

How does the project work on a daily basis in the field? The daily routine remains similar to that described earlier (Bielawski 1984). There are now between 10-12 students per season. Keys to their successful training are the brief technical orientation each morning, the day-long work assisting researchers with field projects, and evening lab work and classes. Their experience is intensive, as it is for any member of a field research team, and they work closely and directly with researchers, sharing camp as well as research responsibilities. Students keep field notes and a daily journal. They are also assigned readings from an extensive field library, and prepare for class discussions. An archaeologist and two archaeology supervisors, a biologist, and a geographer direct the research, monitor data collection, teach on-site and in the classroom. Along with NHS' Field Coordinator, the researchers devote considerable energy to informal counselling and teaching. Scientists and other technical and professional people working in proximity to the field programme are recruited, before and during the field season, to give guest lectures and field sessions to the students. This is a two-way learning experience, for many professionals have never previously worked with northerners.

Students are encouraged to understand science and its role in the changing north, as they will be the people eventually responsible for evaluating, and living with, the results of research and development. They are the future decision makers of the Arctic. I quote from the Society's 1984 report: "The NHS graduate ought to have confidence in stating that 'science works for everyone'." (Bertulli and Strahlendorf 1984:32). Modern northern society is discussed in the context of past and present human adaptations to environment, to other cultural groups, and to change. Both field and classroom activities serve ideally to demonstrate the integration of environment and culture.

Most NHRP participants are Inuit, and come primarily from small Arctic communities. Metis, Dene, and Caucasian participants also come to the program, from communities well within the treeline. Applicants must be residents of the NWT, between 17 and 22 years of age. There is no requirement of current enrollment in school or adult education, but reading and writing English, and basic math skills are required. Upgrading in these basic skills is a process occurring throughout the program. The academic level of the students accepted to the NHRP is rising each year. This is beneficial to the curriculum, which now incorporates more subtle concepts of science. Students are recruited through a comprehensive process including contact with regional schools, all communities, adult educators, previous project supporters, and general publicity via Anik Info satellite and other media. Graduates are active in recruiting new students. The programme is now receiving nearly 60 applications for 12 spaces annually.

NHS' field programme operated from 1979 - 1983 on Somerset Island, completing archaeological research at one large, complex archaeological site, with survey and excavation at smaller satellite sites. In 1984, the NHRP moved its base of operation to Devon Island, where several projects are now in progress near the Truelove Lowland Research Station. The archaeologists are excavating a site spanning 4000 years of prehistory. The biologists have begun an Arctic haze pollution study with two components. One is water quality sampling of seven lakes in conjunction with the federal Department of Environment, Inland Waters Directorate. The second is study of pollutants carried in *Lepidurus arcticus*, a freshwater crustacean. Population studies and parasitology of Arctic char are being examined, and the students also participate in descriptive botany, an on-going bird census, and a musk-oxen behavioral study. In 1985 they aided with a study of Inuit folk ornithology. Earth science studies include vegetation cover, soil types, and effects of slope, aspect and moisture at an intensive study site, and examination of macro and micro process of terrain formation at selected locations away from the base camp. One long-term study will be the environmental impact of a scientific field camp used for several years at a unique Arctic location. Meteorology is also taught through daily weather observations, which are broadcast to Resolute Bay and incorporated in a long-term study by the Polar Continental Shelf Project.

The Society has reported much of this research, as well as results of its educational programme, in seven annual reports, in technical papers, and in articles and presentations for the general public (see the NHS Bibliography, in Bertulli and Strahlendorf 1984, Appendix J). Written reports go to all participants and concerned communities. The NHS Newsletter is also published three times annually and distributed to members and interested agencies in the North and South. Numerous community consultations have been conducted since the NHS' inception, and community visits to the field project are arranged where feasible. Many people in the North know about NHS through helping with the student recruitment process, and with getting students to and from the field site. Students attending the regional high school in Yellowknife have also participated in cataloguing collections for analysis, and received high school credit for this lab work.

NHS graduates return to their communities and schools advertising their participation and heightened awareness of northern science. This is indicated by the number of successive applicants who apply because they "heard about it from someone who went last year".

Arctic Science Assistant Programme (ASAP)

The NHS field programme demonstrates to scientists and graduate students the abilities, skills and keen interest that northerners have in science. One of the long-term benefits of NHS will be development of an indigenous scientific community in the North through the employment of NHS graduates on other scientific field parties. Since its beginning, NHS has functioned informally as a placement agency connecting skilled northerners with scientists seeking field assistants. In 1985 - 1986, NHS began ASAP to serve all northerners interested in experience on research projects, and all researchers working in the NWT. ASAP has established field assistant and researcher data banks, developed from responses to questionnaires sent to NHS graduates and to scientists holding licenses in the NWT. Included are information on research projects and a researcher's interest in employing northerners; field assistant files include the level of each individual's education, training, experience and interests.

Part of ASAP's function will be evaluation of each researcher and field assistant's placement experience. If both are to benefit, the quality of learning and teaching in the field setting must be of an acceptable standard. The placement objective must also be identified, because there are at least two possible courses for native northerners in science. One is to achieve skill and perennial employment as a field assistant. Another is to pursue science through an academic course of studies. Each objective is worthy of support, but has different requirements. ASAP will work to place researchers and field assistants in situations appropriate to the needs of both. Thus part of the ASAP function will be evaluation, and modification in successive years of placement for individuals.

In the NHRP and in ASAP, NHS strives for the highest quality in research, education and training, and a balanced integration of all three. Unfortunately, financial constraints have limited growth. Support has come from private foundations, the private sector, federal job creation and training programs, certain federal departments such as the Polar Continental Shelf Project (PCSP, Department of Energy, Mines and Resources) without whose logistic support the field costs could not be borne, and various departments of the NWT government.

Unfortunately, ASAP has only been funded for 8 months; its continuation will require additional annual funding. Each year, highest priority is given to continuing the field program, with its direct delivery to students and indirect benefit for their communities.

Problems and prospects

NHS faces a nearly-debilitating factor each year: lack of core funding, and lack of sufficient annual operating grants. Why, despite the expressed needs of native northerners (which are not new; see Swinton 1976; Larkin 1978; Weetaluktuk 1979; Inuit Circumpolar Conference 1983) and the expressed interest of the scientific community, are so few human and financial resources actually devoted to involving northerners in science?

A look at NHS' funding sources is illustrative. For the 1985 fiscal year, NHS received fully 47% of its funding through employment development programmes. Obviously, NHS could not take students into a research and education field programme without these funds, and we acknowledge this gratefully. However, that nearly half our funds come from employment development sources, indicates the lack of real commitment to involving northerners "not as labourers only" (Weetaluktuk 1979) in science. It matters not to the Canada Employment Centre if persons employed under these grants are painting fences or learning to be scientific field assistants, or, perhaps, exploring a keen interest in becoming a scientist. Yet the quality of northerners' exposure to science should matter to the scientific community (and to industry, but that is a matter for discussion elsewhere). If an indigenous scientific community is to develop in the North, surely we will have to demonstrate commitment to fostering it, through contributing financial, moral and in-kind support to groups, such as NHS, that provide the critical direct experience, education, and training.

NHS is of course aware of the very minimal funding available for research. But other reasons have been advanced to explain the lack of quantifiable support from academic funding agencies.

One is that the cost per student in the NHS programme is too high. The 1986 estimate per student is:

Travel from home community to field site:	$1500.00
Subsistence — 5 weeks in field and en route:	700.00
Textbooks and research supplies:	250.00
Portion of cost for one researcher/educator:	1000.00
Stipend (minimum wage for five standard work weeks, excludes evenings and weekends):	937.50
TOTAL	4387.50

This estimate omits annual costs for camp and research equipment, which NHS has slowly procured since 1979, and subsistence, accommodation and air charter time that are provided by PCSP.

What are the returns on this investment? First, research is done. Second, NHS keeps its researcher/field assistant ratio at 1:3, so that the quality of data collection and instruction remains high. Third, I believe that any scientist knows that the cost of education, and research, is high. NHS provides an intensive, direct experience with conducting research, and yields research results as well as skilled field assistants. How can it be said that this cost, per student, is too high? If one estimates the cost of developing an indigenous scientific community in the North, I suspect the total would be far higher than a multiple of the per-student costs of the NHS programmes.

Another reason advanced to explain the difficulty of funding NHS is that NHS students are not enrolled in universities. To date, at least five graduates have been accepted or enrolled in university programmes; at least one may well graduate in science. The reason so few NHS graduates are in university is that NHS participation is restricted to northern residents, and weighted towards native students. The low level of university enrollment at present is not a reflection on the NHS programme, but a reflection of low northern native enrollment in universities. Surely NHS cannot be expected to put the cart before the horse, for if northern native students are not exposed directly to scientific activities, it is unlikely that their interest in pursuing university-level science is going to rise of its own accord.

Responses to the ASAP questionnaire indicate that a majority of the scientific community is interested in employing northerners as field assistants, but with reservations (Kense n.d.). Field researchers are interested in employing northerners who are already skilled in data collection, but not in providing an initiation to field science, nor in providing basic skills training. It is unlikely that native northerners will strive to enroll in university science courses without first experiencing research in the field. Who is to provide this experience but an organization like NHS, which has combined research and education in its first priority? Should not the scientific community support NHS as a source of potential field assistants and one day, native northern scientists?

Attitudes towards northern science may be the most significant factor affecting funding for NHS and other projects attempting to involve northerners in science. In discussing the potential for indigenous science, Strahlendorf (1986:7) summarizes these attitudes:

> "Despite . . . strong claims for maximum participation and control by indigenous peoples over scientific research, there is an underlying passive tone in the sense that Arctic science is expected to continue to be initiated and performed by southern scientists. There is little clear recognition of the possibility of an appropriate Arctic science to be initiated and performed by indigenous peoples. Perhaps the implication is that science is perceived as a cultural activity of southerners, and not that science is an activity all of humanity can engage in. Perhaps there is the feeling that Arctic scientific research cannot be done without a Ph.D. and complete assimilation into southern scientific institutions. Perhaps also, there is the belief that scientific research is the handmaiden of economic development projects and so is something suspicious which must be closely watched."

The NHS experience indicates that it is attitudes, both northern and southern, that stand in the way of developing an indigenous northern scientific community. Earlier, I and others have argued for integration of the academic community's needs with those of northerners (Bielawski 1984). If we do not respond with commitment of human and financial resources, both our disciplinary knowledge, and our access to the data base, will suffer.

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THE NORTHWEST TERRITORIES ADVISORY COUNCIL ON THE STATUS OF WOMEN, OBSERVATIONS ON EDUCATION AND RESEARCH

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It is a pleasure for me, on behalf of the Northwest Territories Advisory Council on the Status of Women, to share with you some of our thoughts about education and research particularly as they concern northern women.

First of all, let me explain that the Advisory Council is a group of nine women, appointed by the Executive Committee of the Government of the Northwest Territories to advise the Minister responsible for the Status of Women on matters of concern to women. As a group, our membership is designed to represent equally all of the major cultures and geographic regions of the N.W.T. Incidently, but interestingly our ages run the gamut from "Respected Elder" to much younger and while some of us are employed in the public sector, others are in the private sector or retired. As a group we feel that we have been effective in our role as advocate for Northern Women and it is a pleasure to recognize publicly the responsiveness of our Minister and our Government to our representations.

The thoughts which I will express to you are a distillation of the experience, opinions and hopes of all of us on the Council and as such will necessarily be rather non-specific in origin and general in application. I use the word "necessarily" because as you know, the N.W.T. is characterized by diversity in so many respects and by huge geographical distances. The experiences of a young Inuk in Pangnirtung will be quite different from those of a Metis of similar age in Fort Simpson and different again from those of an "other" in Yellowknife or Fort Smith. Nevertheless we are struck not so much by the differences among us as by the similarities.

For example in 1984/85, across the Territories, the percentage of females enrolled in education programmes was remarkably similar to that of males, varying from 45 to 51 percent of total enrollments from grade one right through to post graduate studies. The only exception to this was in post secondary programmes leading to certification, where females made up 72% of the total number of students.

Many of the difficulties that young women experience in attempting to further their education are shared by their male counterparts. These are difficulties such as loneliness, lack of academic focus, adjusting to new living environments and academic expectations. Our young women do, however, face some unique problems, chief among them being family responsibilities, childcare and housing. These difficulties cut right across cultural boundaries because, for the vast majority of northern women, advancing their education means relocating their lives with the attendant worries of leaving family behind or the complexities of moving "en masse".

Native girls are subject in a particularly poignant way to that uniquely female dichotomy: career or family. The influences generated by the experiences of generations past to adopt the respected and valued traditional female role of mother, nurterer and maintainer of the family are pervasive. At the same time, these young women are encouraged to continue their education and are aware of the increasing number of role models of their own culture and sex who are returning to communities to assume responsible, well paying, jobs. Is it any wonder that the attraction of the one role gives way to the other from time to time or that these young women often attempt to fulfil both roles simultaneously? I think not, but the toll on the individual is great and represents one of the major causes of high drop-out rates at all levels past high school entrance.

The Advisory Council on the Status of Women does not advocate one choice of life style over the other but does suggest that educational institutions must ensure that support systems are in place to assist those who choose to further their studies in being successful.

We see this as a shared responsibility: increased attempts by the northern institutions to prepare students for the rude shocks that await them in larger communities and the southern campus, and by the receiving institutions, to provide adequate support networks to help northern students find their way successfully through the unfamiliar mazes associated with the exciting but often intimidating adventure in higher education that they have chosen.

Those programmes in which northern women have been most successful are those which have provided significant links between sending and receiving institutions and have made available intensive and ongoing support to the student once she has made the move. We think particularly of efforts made by the Eastern Arctic Teacher Education Programme, McGill and the Donner Foundation which assisted financially in these initiatives (see papers elsewhere in this volume).

While I have referred primarily to native women to this point, many of the same obstacles face non-native women attempting to up-grade their skills and credentials. None of us has the luxury of being able to both attend university and live at home; all of us must choose to leave our homes and usually our families, or to take them along; a complex and exhausting process.

While many of the deterrents facing northern women in furthering their education are similar to those of women elsewhere in rural Canada, they are exacerbated by distance, lack of preparation and lack of ready support networks. The ACSW therefore requests that you, as receiving institutions, seriously consider the means by which you could assist northern women to be successful.

Which brings us to the subject of research. Clearly northern students have been more successful in some educational programmes than in others. Some seemingly successful programmes and interventions have been discontinued. The experiences of northern students are not entirely different to those of southern rural students. Some northern graduate students, forty-three last year, are or soon will be, engaging in research. Other students are interested as well in typically northern issues. Is there not an increased role for you, as an organization, to facilitate research into these and other critical issues and simultaneously encourage northern students to research topics relevant to their own past and future? The possible topics are endless and could include the following:

- The correlation between northern students' success rate and specific preparation by sending institutions.
- The provision and effect of mentors on northern students' achievements and satisfaction with post secondary education.
- The inter-relationship of variables such as, success rate, presence of immediate family, simultaneous educational enrolment of spouse and provision of childcare facilities.
- The effect on rates of spousal assault in families where one and/or both partners are enrolled in post-secondary institutions.
- The longterm effect on family relationships of one partner leaving home to attend school as compared to complete family relocation.

But what of those young women who choose to stay in their communities and assume their traditional role? Again the ACSW suggests that there is a role for you here in applying research to the area of distance education and commends you for those initiatives already taken, such as the workshop which resulted in the papers elsewhere in this volume. We see a need for development of field-based programmes and refinement of the current delivery of teleconferencing type courses. Again, some programmes involving distance education have clearly been more successful than others and the reasons why this is so could surely be the focus of useful research. It has been our observation that close monitoring of students' progress, personal follow-up and the easy access to support and consultation have been critical elements of successful programmes in the north to date. While we recognize that the problems involved in education research in and for the Northwest Territories are great, we maintain that the potential positive impact is also great. The ACSW welcomes your interest and offers you our assistance in your attempts to encourage and realize that potential.

SECONDARY EDUCATION IN THE NORTHWEST TERRITORIES WITH SUGGESTIONS FOR THE UNIVERSITIES

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Today the aboriginal people of the Northwest Territories face a major challenge. It is not a new challenge, in fact it is the same challenge they have faced from the beginning of time; the challenge to survive. In earlier times, the aboriginal peoples were confronted by this challenge in its most basic form, they were forced to wrest food, clothing and shelter from the land, or they perished. The fact that they survive today as Inuit and Dene peoples attests to their ingenuity, resourcefulness and determination.

Today the challenge to survive includes two distinct needs. One of these is the need to communicate with, and work effectively with the rest of the world, and develop the knowledge and understanding that will enable them to play a significant and determining role in the evolution and development of the N.W.T. The other is the need to preserve the traditional cultures and values that are the roots of our aboriginal people.

These needs can only be met if native Northerners are able to assume positions of responsibility and control at all levels within the Northwest Territories. Education must play a leading role in preparing people for these positions. It must, moreover, do this in a manner that supports and enhances the cultural heritage of the North. Young people coming through our education system must be prepared to make informed choices based on an understanding and appreciation of both cultural and technological concerns. The need for both "modern" and "traditional" education was, perhaps, best expressed by a Fort Good Hope resident during a visit by the Special Committee on Education in November, 1981. This person said and we quote

> "We recognize the world is changing, and the school, ideally, should give our children the skills to make their living in other ways. But it should *not* conflict with the traditional education parents and elders still want to give their children. It should not confuse children with values and a vision of the world that is foreign to their own. It should give them the tools to make a choice as to how they want to live."

At the secondary level we have not, as yet, had the numbers of graduates that we would like to see, particularly aboriginal students. There have been some gains however. B.C. Gillie, in his report *Survey of Education, 1972,* noted that of the 10,300 students enrolled in schools in the N.W.T., only 200, or about 2%, were enrolled at the secondary school level. 1985/86 enrolment figures indicate that over 1,300 of the 13,400 students registered in N.W.T. schools, or about 10%, are at the secondary level. This constitutes a 600% increase in students with an increase in total enrolment of only 30%. During this time span the number of aboriginal students graduating from our secondary schools has risen from a handful to approximately 33%. However, most of these graduate with a general level diploma rather than with advanced, or matriculation standing that will lead to university entrance.

A cursory look at statistics compiled over the past two years (see Table 1), also indicates that, while the actual number of secondary students is increasing, the proportion of aboriginal students to non-native students at the secondary level is far below what it should be. Looking at Inuit students, as an example, the 1985/86 enrolment statistics indicate that Inuit students comprise 42.7% of all students enrolled in N.W.T. K-12 schools, while students classified as "other" account for 33.7%. If grades 10-12 alone are considered Inuit students make-up 25.2% of the total and "others" account for 57.2%. If grade 12 is examined in isolation, only 12.8% of the students are Inuit, while 68.2% are "others". These statistics indicate that there are serious problems which must be addressed. At the ACUNS meetings where this paper was presented, Mary Lyons (see elsewhere in this volume) said the problem lay in the primary program. We agree this is part of the problem but there are also a number of other factors involved. We all have theories about the nature of the problem, but no one has any hard data to prove their opinion. The frustration is that the N.W.T. has neither the manpower, nor the financial resources, at this point, to do the research necessary to find out what is really at fault.

Now to come back to secondary programs. Again, for a variety of reasons, education at the secondary level has, for many years, been closely tied to the Province of Alberta. While programs and courses at the K-9 level have been developed in the N.W.T. we have continued to use Alberta courses for grades 10-12. There have been many positive features as well as some drawbacks to this arrangement.

The major drawback in our affiliation with Alberta has been the fact that, until very recently, it was impossible to vary many aspects of the Alberta program to better meet the needs of territorial students. This restriction included both material within courses, and courses themselves. The N.W.T. had some flexibility to introduce new courses under the locally developed course designation. However, these courses would only receive approval if they could be of use to Alberta students, so courses such as Inuktitut, or Dene Studies were doomed to be offered for special project credit only, and could *not be considered as* university preparation courses.

Perhaps the most significant development in our long-standing relationship with Alberta education occurred in 1985.

TABLE 1

N.W.T. SCHOOL ENROLMENT BY ETHNIC ORIGIN
1984/85 — 1985/86

1984/85

CATEGORY	K-12	10 - 12	GRADE 12	GRADUATED GENERAL	GRADUATED ADVANCED
INUIT	5561	229	38	25	0
% TOTAL	42.1%	20.5%	12.8%	13.0%	
DENE	2295	125	38	18	3
% TOTAL	17.3%	11.2%	12.8%	11.0%	
METIS	910	110	31	13	3
% TOTAL	6.9%	9.9%	10.4%	9.0%	
OTHER	4458	652	190	72	54
% TOTAL	33.7%	58.4%	64.0%	67.0%	
TOTAL	13224	1116	297	188	

1985/86

CATEGORY	K-12	10 - 12	GRADE 12
INUIT	5741	336	45
% TOTAL	42.7%	25.2%	12.8%
DENE	2209	127	30
% TOTAL	16.4%	9.5%	8.5%
METIS	968	108	37
% TOTAL	7.2%	8.1%	10.5%
OTHER	4528	762	240
% TOTAL	33.7%	57.2%	68.2%
TOTAL	13446	1333	352

On October 22, 1985 a memorandum of understanding between the governments of Alberta and the Northwest Territories was signed by the respective ministers of education. This memorandum formalized the working relationship existent between the two governments. It guaranteed the N.W.T. representation on Alberta secondary level program review and development teams. It also allowed the N.W.T. to develop, produce and implement courses at the secondary level which could then be delivered to N.W.T. students *for Alberta credit*. This last item has a great deal of significance for us as it enables our department to retain those aspects of Alberta programs that meet the needs of our students, while creating new programs in those areas where our needs differ from those of Alberta.

The first courses to be developed under this memorandum are aboriginal studies courses in Inuit and Dene Studies. These courses will include components in language, *Cultural History* and traditional skills and will be available for up to five credits at each of grades 10, 11 and 12. They will likely be made compulsory for all secondary students. It is expected that Inuit Studies 10 will be ready for piloting by September of this year, with Dene Studies 10 following as soon as possible.

Eventually, the department plans to develop aboriginal language courses at the secondary level for both first and second language speakers and to include Cultural History as a core component of the secondary social studies program. We would like to see more courses of this type offered at the university level so that students interested in continuing the study of northern aboriginal cultures and languages would have the opportunity to do so.

Prior to 1978, most aboriginal students in the territories had to leave their home community in order to continue their schooling beyond grade 9. As a result many dropped out of school. In 1978 the Department of Education set up two experimental grade 10 programs, one in Aklavik, in the Inuvik region, and the other in Pangnirtung in the Baffin. Despite the fact that these communities were afforded no personnel and only limited financial resources, the programs have survived, and in the case of Pangnirtung, prospered and grown to the extent that the school has recently received approval to offer grade 11 next year.

Due to the success of, and community support for these initial Grade 10 classes, the department is now implementing secondary programs in other communities that request them, and can demonstrate that they have sufficient students at a Grade 10 entry level to warrant a program. Over the past two years programs have been established in Fort Simpson, Coppermine, Cape Dorset, Igloolik and Pond Inlet, and a new regional secondary school has opened in Rankin Inlet. More high school grades will be opened in the communities this coming school year.

Two alternative programs have also been developed to meet the needs of students who, for a variety of reasons, have not succeeded in the regular school program. In most instances attendance of these students has improved greatly. N.W.T. vocational programs are also available at the secondary level.

To further assist schools in meeting the needs of our secondary students, two ESL courses have been introduced at the Grade 10 level. A three course sequence in basic science, which deals with many territorial science issues, has been produced for use in Grades 10-12.

Two of our secondary schools are also offering grade 10 preparation courses, which focus on individualized upgrading, to assist students with academic deficiencies in making the transition to secondary level coursework.

To Summarize: the Department of Education's goals for secondary level programs over the next 5 year period include: providing equal access to educational opportunities through continued expansion of secondary programs in communities across the N.W.T., assisting in the preservation of native culture and languages through inclusion of this type of program in the curriculum, increasing the number and percentage of students graduating from grade 12, particularly the number of aboriginal students graduating with university entrance requirements, and generally increasing the number of students entering post-secondary education or training programs.

Now, how can the universities assist us in solving some of our problems?

The Association of Canadian Universities for Northern Studies and its member universities can be of invaluable assistance to us in three broad areas, these are:

1. *Information Sharing,*
2. *Research and Training,* and
3. *Easing the Transition of Northern Students Entering Southern Universities.*

Masses of new research data, educational innovations, theories and ways of applying knowledge are developed annually. Universities are on the forefront of these developments, both in conducting the research and in compiling the results. We need to know about these new developments and we also require assistance in translating much of the research into practical applications in our education system.

We have neither the financial nor personal resources to conduct indepth research into areas such as the cognitive development, and learning styles, of northern aboriginal children. Quality research is of critical importance to us. We would like to be in a position to suggest areas, such as these, for research by the universities, also research into the problems I have already described.

Because we don't have a northern university, we also need the assistance of the southern institutions in developing and offering specialized training and professional development courses for our teaching and support staff, that are geared to our specific needs and to provide solutions to these same problems.

For many of our students, especially those born and raised in the N.W.T., the transition from secondary school in the Arctic, to university in a southern Canadian city can be a very traumatic experience. Special counselling services, centres for northern students, orientation programs and courses in northern culture and languages would help our students to feel more at home in otherwise alien surroundings; headstart and degree preparation programs based at universities could assist northern students in need of specific upgrading to "make it" at university.

In return for assistance from the universities in these areas the Northwest Territories Department of Education can guarantee willing cooperation and almost limitless opportunities for original research in all areas of northern education.

We would be very pleased to meet with representatives of A.C.U.N.S. to discuss the special needs of our students and system, and to develop an on-going relationship to meet these needs in the future.

Life in the Northwest Territories has changed dramatically over the past few years, as has our education system. Even though much has been accomplished, we are in constant danger of slipping behind due to the speed with which the development of new ideas is taking place in the rest of the country, and the world.

The assistance of organizations such as A.C.U.N.S. is necessary to us if we are to survive in this rapidly changing world. With your help we will be able to meet the challenge of preparing northerners to determine the future of the north.

Note

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THE INUIT TAPIRISAT OF CANADA: "BRIDGING THE GAP, THE NEED FOR NEW APPROACHES TO NORTHERN RESEARCH AND EDUCATION"

With particular reference to Cooperative Research, Inuit Youth Councils and Ikpik

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Introduction

The north has been subject to intensive scrutiny, by a southern scientific community eager to examine, classify and catalogue it in detail. Virtually every aspect of the arctic environment, its wildlife and the native people who make it their home have been closely studied at one time or another. And yet, throughout this period of time the researchers from the south, and the people in communities throughout the north have largely gone about their lives and work in relative isolation from each other. Very little work has been done to bridge the gap created by a lack of understanding and mutual respect.

Although there are signs that this situation is improving, considerable work remains to be done if northern native peoples and the southern scientific community are to build a new relationship founded upon mutual respect, understanding and trust. It is a relationship that will require long-term commitment, open minds and innovative approaches to old problems. The potential benefits to both parties however, more than justify the time and commitment that this building process will take.

This paper will outline some of the activities, priorities and positions held by the Inuit Tapirisat of Canada (ITC). It will offer some suggestions as to how organizations like ITC and the Association of Canadian Universities for Northern Studies (ACUNS) can work together to promote the development of new and innovative approaches to research in the north.

What is ITC?

Inuit Tapirisat of Canada, is a non-profit, national organization with a mandate to represent the 27,000 Inuit in Canada. Its formation in 1971 was motivated by the need to establish an organization through which to protect a common heritage and to address the numerous concerns which all Inuit held in the face of a rapidly changing North. Throughout the 15 years of its existence ITC has continued to play a major role in the protection of Inuit culture, language and rights. In doing so it has been responsible for the development of a diverse range of organizations and programs designed to meet the needs of the Inuit community in Canada.

ITC currently functions as an 'umbrella' organization. The executive of ITC is elected by a general election involving all Inuit in Canada over 18 years of age. Its Board of Directors is composed of the Presidents of the six regional Inuit associations, as well as members at large elected on a regional basis by the delegates to ITC's Annual General Meeting. It is through the Annual Meeting that ITC renews its mandate and determines its priorities. Delegates from every Inuit community in Canada attend these meetings and work with the Board and Executive to identify concerns and formulate positions. In broader terms however, ITC's mandate is to ensure that Inuit rights, culture and language are protected, to improve communications between Inuit within Canada, and to increase the level of understanding that southern Canadians have of Inuit culture.

ITC is active in a wide range of areas, either through its own special projects, or through representation at the board level with a number of other Inuit organizations. Currently though ITC has identified youth and environmental issues as priorities. Both of these areas of concern have particular relevence to ACUNS. Perhaps none is more critical to the development of increased understanding than those issues that fall under the heading of environmental research.

Traditional vs. Scientific knowledge: Finding a Balance

The land, sea and sea ice, and the wildlife they sustain has enabled Inuit to survive for centuries in an environment most outsiders consider harsh and forbidding. This relationship between humans and the natural environment is absolutely central to Inuit identity and culture. It is a relationship based upon respect, and finely tuned, specialized knowledge related to every aspect of the environment and the wildlife.

When explorers and scientists first ventured north, they quickly grew to appreciate this knowledge. Many would not have survived without assistance given to them by Inuit.

Over the past thirty years technological developments have dramatically altered life in the North, and greatly facilitated access to this new 'frontier'. A major consequence of this history of social change has been the erosion of Inuit control over their own lives. Southern institutions, system of government, and laws have been imposed on Inuit society.

Predictably this process has also seen the imposition of regulatory regimes and management practices, thereby dictating a new relationship between Inuit and the renewable resources within their homelands. At the same time pressures for development have forced Inuit to make claim to what has always been theirs, as well as creating serious concern over the consequences to an environment slow to heal.

In large part these imposed systems of management and regulation have been supported by a scientific tradition that is foreign, and which places little value on the knowledge, skills and wisdom that has been nurtured and passed on within Inuit society.

In practical terms this means that a graduate student fresh from the South is in a position to have far greater influence over management policies than an elder who has spent a lifetime observing, and studying the behaviour of animals upon which he depends for survival. Policies relating to development and management do not adequately reflect Inuit concerns for greater input and adequate protection of the environment.

The scientific community, whether intentionally or not, often provides many of the underpinnings of the policies and management practices which are unresponsive to the concerns and needs of Inuit.

When resentment and bitterness arise, it is a direct result of this lack of control over issues critical to the future of Inuit society, and the lack of respect for Inuit knowledge and skills.

If the southern scientific community has had a role to play in creating the present situation it is equally true that they could contribute greatly to bringing about positive changes.

If the situation is to improve, attention must be given to reducing the gap in understanding that exists between science and Inuit traditional knowledge. Some sense of balance must be re-established between the two and in the process some common ground established.

It is in this search for greater understanding and mutual respect that organizations like ITC and ACUNS have an important role to play. To this end ITC is actively promoting the concept of 'cooperative research'. By this we mean research initiatives where Inuit, either through their associations or communities are actively involved in every aspect of research activity and participate on an equal footing with researchers from the south. Such an approach would, by definition, respond to community needs, and therefore serve to benefit northerners.

Cooperative research implies a willingness to reach beyond the requirements of the conventional research exercise. It requires a willingness to take the time to work through a strategy with people who are probably not well versed in scientific jargon or methods. It also implies a willingness to explore ideas, and concepts that may not be usually considered within mainstream scientific methods. It also must be undertaken with the commitment to make the process work over the long-term.

The potential benefits however could make the extra effort well worthwhile. Research conducted in this way would result in real, tangible benefits to northerners. It has the potential to foster a great variety of innovative training programs that would result in a corps of research support people permanently based in the north.

The work would reflect the best of scientific and traditional knowledge, and would form the basis for management and regulatory strategies that would be more acceptable to Inuit. Perhaps most importantly though, it offers a way of establishing a relationship between researchers from the south and northern native peoples that is based upon trust, mutual respect and increased understanding.

It would also serve an important role in encouraging Inuit youth to pursue career paths that they currently are not taking advantage of. Cooperative research would lay the foundation for a synthesis between two worlds, and enable young Inuit to pursue southern career models without feeling they had abandoned their own past and cultural identity.

Inuit Youth Councils: Young people working for positive change

For the past number of years many Inuit have been greatly concerned by the problems faced by young people. Young Inuit are in many ways at the 'cutting edge' in terms of problems associated with the rapid social change being experienced by Inuit society as a whole. They, more than older members of Inuit society, have to deal with two often contradictory sets of cultural expectations on a daily basis.

The results in the North, as in most areas experiencing rapid social change, are predictably tragic. The rate of suicide among young Inuit is the highest in the country, particularly among young men. Drug, alcohol and solvent abuse are serious problems, and the school drop-out rate is alarmingly high. Combined with an economic environment typified by chronically high unemployment, and a subsistence economy staggering from the effects of the anti-sealing lobby, one is left with a social environment characterized by a sense of powerlessness, and disillusionment.

Inuit Youth Councils (a special project of ITC) were formed in order to allow Inuit youth to begin to deal with some of the many problems which they currently face. It is a community-based project which encourages young people, with the cooperation and assistance of other groups within their community, to find their own solutions to existing problems. Effective solutions must come from within Inuit society itself; history has repeatedly shown that solutions imposed from the outside only exacerbate the situation. Initially, the project focused on increasing the level of awareness, among the general public, of conditions facing young people, and the urgent need to immediately begin work to bring about change. Over the last two years individual community youth councils have initiated programs ranging from the formation of theatre groups, to counselling programs, and instruction by elders in traditional skills and knowledge.

Another key element in ITC's youth council project is the sponsorship of an annual International Inuit Youth Camp, at Ikpik Bay on Baffin Island. This camp brings together Inuit youth from across Canada, and includes delegates from Alaska and Greenland. Soviet Yuit youth have also been asked to attend, but have been unable to participate to date. Ikpik Bay allows Inuit youth from around the circumpolar north to come together in a camp environment and discuss their common concerns. The focus to date has been on issues such as land claims, the educational system, the preservation of Inuit culture and language, as well as strategies through which Inuit youth can work to improve conditions in their communities. Delegates to the camp have repeatedly addressed the need to develop orientation programs for southerners coming to work or study in the north. To this end Inuit youth councils have extended invitations to students involved in Northern Studies programs to attend Ikpik Bay, and exchange views and ideas with the Inuit delegates.

An important area of discussion at Ikpik Bay has been concerns with the educational system. Education is critical to the future of today's young people, and yet most Inuit youth consider the educational system to be a focal point of the conflict between Inuit and southern culture. The differing expectations between the school and home environment is a source of conflict and anxiety.

Although improvements have been made in recent years, the northern school environment and curriculum closely resemble those of southern schools. Inuit have for many years been calling on government to develop and implement a northern curriculum. Until culturally relevant programs and materials are put in place, and more effort is made to ensure that teachers from the South are more sensitive to the people and communities within which they are working, the educational system will fall far short of its potential as a vehicle for positive change.

Some statistics on the current situation serve to highlight the extent of the problem. Two-thirds of all Inuit in Canada over the age of 15 have less than a grade 9 education according to 1981 census figures. Furthermore, only 17 Inuit have graduated from academic programs (84 from diploma programs) at the grade 12 level in the NWT over the last five years. These statistics are even more alarming when put in broader context. The Inuit population in Canada is predominantly young. Over 50% of the Inuit in Canada are under 20 years of age. Over 200 Inuit will enter the labour force each year for the next ten years; and yet only 37% of Inuit in the NWT over 25 years are employed, compared to 78% for non-Inuit residents. Many Inuit communities, particularly the smaller communities which do not benefit from being government administrative centres, report unemployment rates of 75%.

Although Inuit hold 45% of the jobs with the largest employer in Nunavut, the Government of the NWT, 73% of these jobs are clustered on the two lowest pay ranges. Only one Inuk is currently employed at a senior management level within the Territorial government.

These statistics clearly highlight the urgent need for a concentrated innovative approach to the problem. The consequence of inaction is that the best jobs will continue to go to outsiders, and Inuit will continue to be bystanders in the development of their own homelands.

Without special training and educational programs designed to meet the particular needs of the North and the allocation of resources to deliver these programs, it will be a difficult up-hill trek. Existing pre-employment and upgrading programs are clearly unable to keep up with the demands put on them. Reforms to the educational system, although proceeding, will not take place quickly enough to address the needs of young Inuit currently in the system.

Once again, researchers from the South and the institutions they represent have the skills and resources to assist in this difficult task. If every research project undertaken in the north consciously worked to ensure it contained a training component, it would provide lasting benefits to local people. Increased sensitivity to, and respect for traditional knowledge would, as previously discussed, reduce some of the psychological and cultural obstacles Inuit currently encounter through the educational system. Northern Studies programs must continue to ensure that each new group of graduates are sensitive to and respect local concerns and views. For its part ITC through its Youth Council project will continue to work on the development of orientation programs for southerners working — or studying in the North.

And finally, southern universities by working with Inuit as partners could break new ground in the development of innovative extension and outreach programs designed to meet the needs of northerners.

All of the ideas discussed in this paper obviously require time, effort, patience, and open minds to bring to fruition. Inuit Tapirisat of Canada is ready to begin to grapple with some of these difficult tasks. We are sure the Association of Canadian Universities for Northern Studies and its members are equally committed to this goal, and we look forward to working together to achieve it.

Note

Further information on the ITC can be obtained from the organization's annual report. The 15th Anniversary report for 1985-86, for example, contains a history of ITC, notes on such things as the Inuit Circumpolar Conference, the Inuit Youth Councils and the Ikpik Camp and reports from the regional affiliates (viz. Baffin Regional Inuit Association, Committee for Original Peoples' Entitlement, Kitikmeot Inuit Association, Keewatin Inuit Association, Makivik Corporation, Quebec and the Labrador Inuit Association. ITC produces individual reports on the annual Ikpik camps. The organization's journal is *Ookpik* (Journal of the Arctic Society) and they have recently begun publishing *Kakivak*, a newsletter. (ed).

MAKIVIK RESEARCH DEPARTMENT AND THE DEVELOPMENT OF INUIT-BASED RESEARCH AND SCIENTIFIC EDUCATION IN NORTHERN QUÉBEC

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Introduction

The purpose of this paper is to briefly describe the objectives and accomplishments of the Makivik Research Department and to evaluate its future role in northern research. Makivik Corporation was created as part of the implementation of the James Bay and Northern Québec Agreement and provided the impetus and base funding required to initiate the first phase of a new program in northern research.

> "Makivik is an Inuit association created under Québec law in 1978. Its membership is composed solely of Inuit beneficiaries under the James Bay and Northern Québec Agreement signed in 1975. Makivik has the legal responsibility to implement and protect the various rights and benefits of Inuit under the Agreement. In addition, its objects provide that it promote "the advancement of education of Inuit" and "foster, promote, protect and assist in preserving the Inuit way of life, values and traditions".

The mandate of Makivik is broad and complex. The James Bay Agreement has created both opportunities and problems and the Inuit of Northern Québec have had to mobilize very quickly in their attempt to meet the consequently expanding responsibilities that have become part of the "Inuit lifestyle" since the signing of the Agreement. From the outset, one of the important goals of Makivik was to accumulate a data base and a staff to collect, utilize and apply this data base in order to maintain some independence from outside professionals in its planning and decision-making.

The research department

The first step in the development and use of a data base was to create a research department within Makivik. In so doing, the Inuit of Northern Québec also committted themselves to a process of redefining the scope, purpose and control of northern science and research, as traditionally carried out by universities, governments or other scientific bodies. The emergence of Inuit within the research field was not intended to exclude the work of outsiders. It was intended, however, to force a change in the values and priorities of this research and to establish a more equitable system for Inuit participation in those aspects of science that could affect their life or livelihood.

The Research Department was formed around three critical principles. First, to assure that Inuit are able to have direct participation in the design, execution and application of research projects that affect the culture, livelihood, land and resources of the north. Second, to transfer skills and expertise in scientific research from the south to the north. Third, to make certain that Inuit concepts and knowledge about their environment, resources and society would be systematically recorded and used to form the foundation for the development of a northern scientific capacity.

The process within which these principles are incorporated is now being carried out in stages. The first stage involves the creation of on-the-job training programs that are being run by non-Native researchers hired as full time employees of Makivik. A second stage involves an opportunistic approach for acquiring research contracts in order to carry out studies that were viewed by Inuit as important and which could serve as a vehicle for training. Over time, these stages have started to include a more planned approach to the choice of research topics and priorities and there is a beginning towards expanding on the job/work experience with Inuit having formal post-secondary education.

Work of the Research Department is being carried out from three centres of activity. These are located in Kuujjuaq, Kangiqsujuaq and in Montreal. Each of these centres has a particular set of responsibilities and each is organized to encourage their independent development. Although each centre may have different roles all three adhere to the principles stated above and they all are committed to using research and scientific education as part of self government and social development.

The Kuujjuaq Research Centre, formed in 1981, is oriented primarily towards biological studies and research on renewable resources and on the application of information to wildlife management. It has a staff of four Inuit full time, three part time Inuit students and two non-Native researchers. This group has worked to combine both their interest and competence in assisting the communities in collecting data about and planning for the long-term use of wildlife resources.

The Kangiqsujuaq Research Centre, formed in 1983, has at its primary purpose the development of cartography and remote sensing as a means for collecting and communicating information on the northern lands, environments, resources, and communities. Cartography was selected as a major focus because the experience has shown that maps and other forms of graphic presentations of data and ideas can transcend problems of language differences and can work within a medium well-understood by Inuit elders and young people alike. The

Centre has a staff of three full time Inuit and one non-Native researcher/cartographer.

The Montreal Research Centre, formed in 1976, is concerned with a more general development of the research program. It is assumed that in time much of the role for the Montreal office will gradually be assumed and reinterpreted by the northern centres. For the time being, however, the Montreal office is able to address more spontaneous research needs for all communities, to organize funding and to carry out the politics required to maintain and develop the northern program.

It is involved in the development of the hardware and software for computer assisted data analysis, including cartography, and provides assistance to the northern Centres on additional biological and wildlife management research and is responsible for programs in social and environmental impact assessment, regional planning and for the completion of economic and community feasibility studies.

The Makivik Research Department does not represent the only research now being carried out in the north, nor is it the only group concerned with the collection and utilization of information. University researchers are still an important part of northern science although they are perhaps less "free" to develop and pursue a topic independent of Inuit communities or organizations; government departments still have a research capacity and mandate within Northern Québec; and as another presence, scientific consulting companies have now become a sector that must be acknowledged. In addition, other Inuit-based institutions in Northern Québec have started programs that involve research. A particular example is the Kativik Regional Government that has a full range of responsibilities dealing with the environment, planning and technical assistance and Avataq Cultural Institute which is responsible for conducting or supervising cultural and archeological studies.

Research department projects and programs

The following list of projects provides a brief introduction to the topics that have been pursued by the Research Department. If these projects were listed in chronological order rather than grouped by subjects, they would provide an insight as to how the Research Program has developed and changed since its start. The various programs have often been linked to government agencies and they have been developed around the principle of shared responsibility and cooperation.

Harvesting research

Studies to determine in a quantitative way, the pattern and level of resource harvesting throughout Northern Québec formed the beginning of a research program within Makivik. At that point a decision was made to develop an internal capacity for research rather than to rely on hiring independent researchers from outside. From that decision, flowed all of the other objectives and activities that now define the Makivik Research Department.

The first harvest study was a five year program that attempted to quantify the level of Native harvesting for all of the species important to the subsistence economy of the North. This program was carried out under the auspices of the Research Committee that helped in the design and the guidance of the study. Nevertheless, the flexibility of the project management and the acceptance of a principle for cooperation based on real Inuit participation, not simply compliance by Inuit, meant that this work had an important impact at the community level. The communities, through Makivik, felt that they were knowledgable about and in control of every phase of harvesting research. In conjunction with the five-year study, more specific harvesting studies have been carried out on the Koksoak River as part of an assessment project of potential impacts from the Caniapiscau diversion.

The enthusiasm of the first harvest study was recently carried over to a call for continuing this type of research in order to monitor changes or problems in resource harvesting. This "second phase" of a harvesting studies illustrated however, that Inuit hunters found it difficult to constantly remember and record the results of their hunting effort on a systematic long-term basis. Consequently it was realized that a research program had to be based on a rationale and methodology that was more suitable to hunters' perceptions of a required data base and which conformed more to their sense of how best to participate. In other words, the early success of harvest studies need not be a primary rationale for their continuation.

Resource evaluation and management

An interest in determining the level of harvesting naturally led to research that involved expanding the information base about resources and their management. Three major species have been included in this work. These are: Beluga whale, Arctic char and salmon, and Eider ducks.

Beluga whale research began with a joint venture between Makivik Research Department and a consulting company. The principle underlying the work was to share in the design of the study and to cooperate in data collection and analysis. The study provided an opportunity to develop an experience in censusing and in the organization and completion of detailed field studies including systematic observation of numbers and behavior along with the collection of the biological samples. This first project was followed by additional work with Federal Department of Fisheries and Oceans. These studies focused on determining the numbers and management plans for summer stocks in two river estuaries and they asked specific questions about particular forms of behavior for these stocks.

A second major area of investigation involves carrying out censuses and behavior studies of the two major sub-species of Eider ducks. This work also provided an opportunity for the Research Department and for Inuit to become more involved in designing research around a specific problem and then to develop a methodology for accomplishing the research that is compatible with both Inuit and outside researchers. The first phase of this study was done as a cooperative effort between the Inuit and Canadian Wildlife Service while the second phase represented a more independent project that was designed and organized entirely within the Makivik Research Department and funded by the Environmental Studies Revolving Fund.

The third sector of resources involved the study of Arctic char and salmon. The first major Arctic char study conducted baseline studies that would assess life history, ecology and basic stock assessment on three major river systems. This work was financed by Makivik and by the Kativik Regional Government under their Hunter Support Program.

The most intensive and continuing studies of the fish are being carried out in the rivers of the southern Ungava Bay and primarily involve Atlantic salmon. Some of these studies, especially in the Koksoak River, involved the continued collection of harvest and fishing effort data and the program also includes taking biological measurements. The long term nature of this work is intended to provide a comprehensive profile of both the resource and the fishery. The work is funded as part of the program of the Caniapiscau-Koksoak Joint Study Group that was established under the James Bay Agreement and mandated to monitor the impact of diversion on the Koksoak River.

A second major study was started on the Whale River and George River. The Whale River study followed the objectives and format of the Koksoak work and received funding from both le ministère du Loisir, de la Chasse et de la Pêche, and Makivik Corporation. The George River study involved a major research effort sponsored by the same two groups and was designed to establish population estimates for Atlantic salmon based upon tagging and recapture methods.

The duck and fish studies were particularly important because they encouraged the establishment of a biological laboratory within the Kuujjuaq Research Centre. This facility has the capacity to analyse eiderdown, to experiment in statistical analysis, and to train Inuit on aging and sexing fish and on the interpretation of these data. All of the work has been presented in written reports including formal publications and two publications in Inuktitut.

Ecological knowledge and land use

This major research effort has a history that relates back to the studies first carried out in the Northwest Territories during the early 1970's but its purpose within Northern Québec is to provide a much more precise information base on past and present land use and on the extensive knowledge hunters have to support their patterns of land use. This work includes all species for all communities. A special emphasis has been placed on Eider ducks because of the outside funding available for this work.

The methodology for this project is complex and the long term field work is intense. Information is gathered by individual and group interviews that can last many hours; these interviews result in the creation of individual hunter maps by species, season and time period; and they also result in ecological maps for individual species that are supported by written descriptive notes and taped interviews. All of the information is being compiled on mapping computers according to special programs written to accommodate the data and to produce maps and descriptive texts in Inuktitut.

This research is being funded by Makivik Corporation because Inuit feel that they should have primary access to the information and its interpretation. Although many of our projects have been based on productive cooperation with government and other research organizations, the unique nature of this data base calls for Inuit control on its use. It can be shared but the Inuit preferred to set the guidelines for this sharing. When completed the data will be presented in a set of community atlases. It is already being incorporated into many specific elements of resource management and into a regional management plan, and it will be used by Kativik School Board for the development of education programs and for the creation of local geographies.

Aerial Photographs and remote sensing

Another area that has been developed and which is being carried out by Inuit within training programs is the development of an aerial photographic record for critical land and coastal regions. This work is also being supported by outside contracts for a detailed aerial photo interpretation that will lead to a land classification for use by the Northern Québec Inuit. The aerial photos flown in the North are low level colour photos that include stereo pairs and various types of oblique views of the landscape. The size and cost of this activity, which has primarily been financed by Makivik, is limited to ten square kilometers around each community or to specific critical resource areas that have been designated by Inuit. The interpretation is being done from government photos and involves a larger area at a reduced scale. The land classification work is intended to support community and regional planning, and to aid impact assessment studies.

Impact assessment and feasibility studies

An emerging field of research interest and activity involves impact assessment and feasibility studies. This work is related to various types of development projects and it reflects certain conditions for the protection of the environment and for the development of the northern society and economy as set out in the James Bay and Northern Québec Agreement. The Inuit view impact assessment as being closely related to planning and they also realized that they must have an active voice when establishing the value system around which positive or negative impacts can be identified and evaluated. Feasibility studies are also viewed by Inuit as a part of a larger planning process that can incorporate projects ranging from small resource development enterprises to the creation of new communities.

Impact assessment studies began with the need to create new infrastructures, especially airstrips, within communities. Makivik Research Department was provided with funding from le ministère des Transports, Québec, to carry out the first six of these studies. This process provided an opportunity for Inuit to understand the role and content of impact assessment studies in relationship to a formal review process. Although these studies were carried out for a vital part of northern infrastructure, they provided experience and insight that will be important when evaluating other types of development activity.

Two types of feasibility studies have recently been undertaken. The first involves the large scale economic development plans for an offshore fishery. In this study, which was funded by le ministère de l'Alimentation, des Pêcheries et de l'Agriculture du Québec (MAPAQ) and jointly carried out by personnel from MAPAQ, Makivik and by the Inuit of Killiniq, linked the scientific evaluation of stock assessment with the economic consideration of fishery development and with the social role of large scale resource development projects in the life of small communities. The second type of feasibility study is for the relocation and development of new communities. Makivik Research Department is presently carrying out a major feasibility study on the relocation of Inuit from the former community of Killiniq to a new site on the mainland of Québec. The study has been funded by the Department of Indian Affairs and Northern Development. The Makivik Research Department is responsible for carrying out social and economic studies and for organizing and managing the technical expertise required for site engineering, infrastructure, planning and cost evaluation.

Other studies of interest

In addition to the work described, several other types of work are underway. Studies on the river modification in relationship to enhancement of the Arctic char fishery have been started as a joint endeavor between Makivik Research Department and University of Waterloo.

In addition to the work of Makivik Research Department, Avataq Cultural Institute has initiated serious archeological studies throughout the Northern Québec territory and they have also begun the first stage of a comprehensive history of the Northern Québec Inuit. Studies by Avataq have also included work on Inuit place names, traditional medicine and on the legal aspects of family names.

Current problems and future prospects

This brief discussion of the Research Department provides an overview of what will hopefully evolve into a major direction in the design, conduct and application of northern research. Prior to the development of the Makivik Research Department's program, the Inuit had little involvement or control over any phase of research. Studies seldom reflected a concern with Inuit needs or priorities and they were accomplished without relevant participation of local people. Codes of research ethics, such as those put out by the IBP and ACUNS, helped to define the obligations of researchers to a community but they did not have the power to help create new directions in cooperative and participatory programs of study. As well, certain individual researchers played important roles and provided exemplary models of how to work with and for, communities. Unfortunately, neither codes of conduct nor the exploratory activity of individuals could assure real changes in the large and well established system of northern research.

The developments outlined above have helped to create change but these changes have not yet coalesced into a momentum that can be easily maintained by Inuit. The creation of an organization such as the Research Department cannot in itself institute all of the changes that may be required; it cannot provide all of the answers; and it should not provide the only direction for the future. It is a new institution, and it cannot be assumed to speak on behalf of all Inuit with respect to research and northern science.

The problems that must be solved are complex and many of the solutions involve long term processes and major commitments by many parties. To begin with, Inuit have different and even conflicting definitions of their needs and there are many points of view about the role or importance of research for meeting these needs. All Inuit appear somewhat skeptical about the value of research and this attitude cannot be easily overcome.

It is reasonable to assume that the research process may not be trusted by some even if it is carried out by Inuit while for others, problems arise because their expectations of what research under Inuit control may be able to accomplish, far exceeds its capacity. It takes many years to develop an adequate data base and still longer to establish the Native expertise to utilize this information effectively. The North in general and Inuit organizations in particular, have minimum infrastructure for conducting research, and the funding for projects, infrastructure and education or training is grossly inadequate especially when "catch-up" is required.

When the Research Department was being organized, the non-Native personnel echoed sentiments often heard throughout the North that they would soon work themselves out of a job since the entire program would be taken over by Inuit. This opinion was superficial and it reflected a limited view of the importance of a shared cooperation between two cultures, scientific world views and systems of learning. The eventual replacement of non-Native personnel by Inuit can still be stated as a goal but only when defined in terms of a realistic means of reaching this goal. On-the-job training is important and it can create knowledgeable researchers but it cannot replace the importance of long term formal education. It is here that new ideas must be developed and new programs put into practice. Universities and specific disciplines have an important role to play and it appears as though organizations such as ACUNS can help bring about change.

An emphasis on formal education does not mean that the model, concepts or data around which Inuit can build research must mimic that of the southern scientific establishment. It will not ignore this establishment or many of its practices but it will not necessarily be the same. Somehow, in the process of development, Inuit must move into formal education but formal education must also recognize the unique structure and contribution of Inuit knowledge in relationship to their society. Both systems of knowledge can inform each other rather than be lost in endless controversy over who knows best.

Note

We are grateful to Mark R. Gordon and Bill Kemp for this contribution. Mr. Gordon attended part of the ACUNS meetings in Yellowknife upon which this volume is based. The Makivik experience is an especially important one for those involved in research and education in Canada's North today (ed).

COMMITTEE FOR ORIGINAL PEOPLES ENTITLEMENT (COPE) WITH SPECIAL REFERENCE TO THE COPE LANGUAGE PROJECT (CLP)

Mary Lyons

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I am the Education Officer for COPE, The Committee for Original Peoples Entitlement, whose headquarters are in Inuvik. The COPE LANGUAGE PROJECT originated with Larry Osgood, who now works with Inuit Broadcasting Corporation in Ottawa doing childrens' TV programs in Inuktitut. Larry Osgood coordinated the linguistic research for the COPE LANGUAGE PROJECT with the cooperation of Laval University which resulted in the three Inuvialuktun language grammars and dictionaries. These dictionaries and grammars were researched in the six COPE communities of Aklavik, Inuvik, Tuktoyaktuk, Paulatuk, Sachs Harbour and Holman Island by a linguist from Laval University, Ronald Lowe, in the three Inuvialuktun dialects.

One of the primary goals of the COMMITTEE FOR ORIGINAL PEOPLES ENTITLEMENT is to revitalize the Inuvialuktun language. This is not an easy task! There are approximately 2,800 Inuvialuit in the six communities and most of those under 40 years of age do not speak their Inuvialuktun language. However, COPE has done an impressive amount of work since the land claim agreement was signed in June of 1984. We have the 3 dictionaries and 3 grammars. The COPE LANGUAGE PROJECT gets its core funding from the GNWT Department of Education to develop the Inuvialuktun Language curriculum.

The COPE LANGUAGE PROJECT has trained Inuvialuktun Language Instructors, who are mostly older Inuit women, to teach the Inuvialuktun Language in the primary grades. The original agreement between COPE & GNWT Department of Education ws that once COPE trained the Language Instructors, the GNWT would give them full-time permanent positions in their respective schools. As of today, the only full-time permanent position is in Inuvik, and the commitment from the GNWT for the other five positions has to be renewed yearly. If the GNWT rationale is that there are no person years — I say you are wrong — remove the Executive Field Officers in the communities whose duties and job descriptions are questionable and vague — I have yet to hear a government bureaucrat explain to me the need for these field officers when there is such a valid need for our Inuvialuktun Language Instructors. Holman Island does not have a language instructor, the Inuvialuktun language is taught by two Inuit Classroom Assistants.

The curriculum has been developed for Kindergarten, Year 1 & Year 2. This is not a graded curriculum, each child develops at his/her own pace. Year 3 is in process. The person who develops the Inuvialuktun language curriculum resides in Nova Scotia (a long way away) and the ideal would be to have a resident curriculum teacher within the Inuvik region. Most of the curriculum is based on the seasonal calendar of the six communities and once the curriculum is completed, it is sent to the Language Instructor for correction and approval before it is finalized. The COPE LANGUAGE PROJECT would like to see a Language Centre based in Tuktoyaktuk to develop curriculum in the Inuvialuktun language and also to develop primary curriculum which reflects and mirrors the culture and environment of the Western Arctic Inuvialuit. One area of research the CLP is interested in is developing research into Western Arctic Inuvialuit learning style, such as has been done by the Kativik School Board in Quebec (see papers in this volume). The cognitive style of the Inuit is different and needs to be researched and documented to influence future curriculum. The CLP invites ACUNS to help us — you have the expertise in this area and we would like to help our children become successful students.

At the Professionalism Workshop which the CLP had in March for the Inuvialuktun Language Instructors, and Inuvialuktun Interpreter/translators, we learned that native homes are *100%* affected by alcohol. The rules change every day if one has an alcoholic in the home and this disease ALCOHOL does not provide a healthy normal learning environment for our children and this factor needs to be addressed by all educators in the north. The CLP would like to see an orientation about alcohol given to all southern teachers coming to teach our children, also an orientation to all social workers, hospital personnel and to the RCMP. I myself am just beginning to understand that alcoholism is a disease and I would like to work with educators to help our children understand alcohol so that their self-esteem is not eroded. The Inuit of the Beaufort and Delta have had a revolving door of personnel at all levels of government coming to work in the six communities. There is NO continuity of personnel and the present primary curriculum which our children digest is NOT a consistent or culturally relevant curriculum. The GNWT Department of Education has not developed a primary curriculum which reflects or mirrors the environment or culture of the Western Arctic. What the GNWT has are huge binders with a graded checklist and when you combine this fact with the southern teacher, who usually has no cross-cultural experience and who is experiencing culture shock by the north, the isolation of a coastal community can be overwhelming. Please don't get the idea that I am condemning teachers — I have met many sensitive and intelligent teachers who really care and empathize with the different cognitive style of learning of our Inuit children — this cognitive research has to be done before a relevant curriculum can be developed and the curriculum must be developed by US, the Inuvialuit. You are all educators here and you all are aware of the subliminal influences of early childhood learning. When our Inuit children open any book or learning materials in the primary grades, they do not see themselves or their culture mirrored back and this has been proven to have a negative effect on a native child's learning and development. THIS MUST CHANGE!!

Here is what I see as the ideal situation to solve the problem:

1. Research into learning style using native people trained by YOU in the Universities.
2. Curriculum developed to serve the unique learning style again, done by US with help from YOU in the Universities.
3. Training programs for our southern teachers aimed at our needs. This must be done by YOU but with help from US. (We know what we want. You know how to do it.)
4. Money and facilities to do all this. This must come from the Department of Education, GNWT. You in the universities with your experience of grants and programs and we in the north, with our knowledge of our needs, must form a team to get these resources and use them for our children.

I would like to invite you to help us. As a primary educator I invite the GNWT to get their priorities straightened out. I caution you not to spend or soak all your time and money into the development and enhancement of Arctic College. We have to be realistic, we are NOT getting the native graduates, our native students are dropping off in the primary grades and unless we develop a meaningful and relevant primary curriculum which enhances the Inuvialuit culture and pride, our native students will continue to be rootless and aimless and unable to benefit from Arctic College or any other higher education.

Sources

The Siglit Inuvialuit Uqausiita Kipuktirutait (Basic Siglit Inuvialuit Eskimo Dictionary) by Ronald Lowe, COPE, Inuvik, N.W.T., Canada X0E 0T0, 1984, with its Foreword, is a valuable source of information about COPE and the Language Project. The dialect of the COPE people, the Siglit (i.e. coastal) Inuvialuit of the Beaufort, is called Inuvialuktun.

The Committee for Original Peoples Entitlement (C.O.P.E.) was founded in Inuvik in 1970 as an organization to represent all the native people of Canada's Northwest Territories. The immediate reason for its founding was the discovery of gas and oil in the Western Arctic and the stepped-up activities of exploration companies in the region. But its broader goal was to provide a "single voice" for native people to speak to government and industry on a wide variety of issues, including land rights. In 1973, C.O.P.E. became a regional organization representing the Inuvialuit only, and in 1978 it signed an Agreement in Principle with the Federal government on the settlement of Inuvialuit land rights. In June 1984, it signed a Final Agreement with the government, and in August of that year the Agreement became Canadian law through a proclaimed act of Parliament.

The first of four basic goals agreed to by C.O.P.E. and Canada in the Agreement in Principle reads:

> To preserve Inuvialuit cultural identity and values in a changing northern society.

Recognizing the importance of language to cultural identity and to the survival of cultural values, C.O.P.E. formed an Inuvialuktun Language Commission in May 1981. Its members were representative speakers of the three Inuvialuktun dialects. An Inuvialuktun Language Project was developed that foresaw a four-phase program:

1. To record, analyze, and describe the dialects of Inuvialuktun.
2. To develop Inuvialuktun teaching curricula, teaching materials, and a teacher training course.
3. To institute Inuvialuktun language programs in schools and communities.
4. To monitor and promote the continuing use and learning of Inuvialuktun.

OPERATION RALEIGH
A UNIQUE OPPORTUNITY FOR YOUTH

David Pelly

Beauly, R.R. #1, Castleton, Ontario K0K 1M0 (416) 344-7701

Over the next three years 4,000 young people — including 100 Canadians, 17-24 years old — from around the world will participate in Operation Raleigh, an international programme of expeditions, scientific projects, and community services. The activities, already well underway, will take place in 40 countries on six continents around the world. His Royal Highness Prince Charles, Patron of the programme, suggested the theme: "Science and Service."

The 100 Canadian youths, who will represent Canada on expeditions to far-flung corners of the globe, are being selected from across the country. Each candidate selected will travel to join an expedition for a period of about three months. The expeditions will be hard work, on a scientific or community service project, but the rewards are plenty. Young people who have already returned from their assignments in the Caribbean, South America, and the South Pacific all say that it was a once-in-a-lifetime experience they would not have missed.

In the summer of 1988 Operation Raleigh will come to Canada, in the form of a canoe expedition on the Kazan River in the Northwest Territories. Plans are now well developed for a group of 24 young people from around the world, plus a highly-skilled staff of leaders, to spend approximately six weeks on the river, following an extensive training camp in Southern Ontario. In conjunction with ACUNS several valuable and challenging scientific projects have been identified for the expedition, ranging from archaeology to biology.

Operation Raleigh would like to hear from:

- Northerners aged 17-24 who would like to participate in an expedition, be it the 1988 trip on the Kazan, or one of the phases somewhere else in the world before then.
- Qualified individuals who might join the 1988 expedition as scientific advisors, perhaps as part of their graduate work.
- Members of the scientific community interested in the Kazan area.

The address is: Operation Raleigh Canada
The Weston Centre
22 St. Clair Avenue East
Toronto, Ontario
M4T 2S3

tel: 416-923-4356

INUIT SILATTUQSARVINGAT: A PROJECT OF THE BOARD OF DIRECTORS OF THE INUIT CULTURAL INSTITUTE TO ESTABLISH A MUSEUM-BASED CULTURAL TEACHING CENTRE

Michael Shouldice
Inuit Cultural Institute, Eskimo Point, N.W.T. X0C 0E0 (819) 857-2806

Background

The Inuit Cultural Institute (ICI) proposes to establish a unique cultural learning facility which would allow Inuit to integrate features of a museum and a learning institution that will recognize and support individual and community desires to revitalize and support traditional and contemporary forms of Inuit culture. This facility is called Inuit Silattuqsarvingat (Silattuqsqarvik or IS).

Institutional description

The Inuit Cultural Institute was established in 1974 and is based in Eskimo Point, N.W.T. It is the non-profit cultural/educational group representing Inuit in the Northwest Territories. It is primarily funded by contributions from the Cultural Educational Centres Program of the federal Department of Indian and Northern Affairs. During its time of operation ICI has conducted a variety of research projects for the preservation and maintenance of Inuit cultural identity in the areas of traditional research, linguistic development and educational materials. ICI also provides a variety of services, such as organizing conferences, cross cultural workshops, contract research and translation, and publications.

The Inuit Cultural Institute is well designed to conduct and house cultural/historical research. The growth of cultural and educational materials in the N.W.T. is rapidly increasing and more demands are placed on the Institute to prepare educational materials for schools and at the post secondary level. As well, under the land claims agreement, the role of ICI is expanding, and there is need for a museum facility to house Inuit cultural materials. ICI's human and financial resources are strained to meet this demand. There is need for a facility which specializes in the collection and preservation of material culture and the development and delivery of cultural/educational programmes.

Inuit Silattuqsarvingat has a strong role to play in cultural development in the N.W.T. It represents the first opportunity for Inuit organizations, government agencies, post secondary institutions and community authorities, to come together and have input in the discussion of the overall direction of cultural/educational programmes for the N.W.T.

Inuit Silattuqsarvingat has two primary programme components: a museum devoted to the collection and maintenance of Inuit cultural materials, and the development and delivery of Inuit cultural/educational materials. The proposed facility received strong grass roots support from regional education societies, Inuit organizations, community councils and the elders.

Linkages

IS has developed professional relationships with, and has been invited to draw on the resources of various institutions such as: The Prince of Wales Northern Heritage Centre, the Winnipeg Art Gallery, EATEP, McGill University's Centre for Northern Studies, The Science Institute of the N.W.T., the Boreal Institute, The Arctic Institute of North America, National Museums of Canada, the Canadian Museums Association, the Inuit Broadcasting Corporation, Concordia University's Department of Communications, and the Canadian Broadcasting Corporation.

Support

IS has received support from major Inuit organizations, the Inuit Elders Conference and regional educational authorities. It has received recognition from Tungavik Federation. Federal funds have been received from National Museums, EDA, and Indian and Northern Affairs. These funds have been used for staff training expenses, committee meeting expenses, consultant fees and development of training programmes. The GNWT Department of Culture has provided support for staff training, technical expertise, staff salaries, development of a museum guide and public relations materials. The Inuit Cultural Institute continues to provide overhead, bookkeeping, staff housing, telephone, computers and office materials.

Work schedule

The Project is in the second year of a three year development phase. At the end of year two (March 31, 1987) we will have:

a) completed a needs assessment and collections profile carried out by Dr. Terrence Heath (ex Director of the Winnipeg Art Gallery and Museum Consultant)

b) finalized the draft of a collections policy

c) finalized the draft of a conservations policy

d) started an educational collection

e) finalized the management plan

f) finalized a capital funding strategy with TFN

g) completed two pilot project for delivery in year three:

   1) a travelling exhibit on Inuit clothing styles and patterns
   2) an adult education course for young married couples on traditional child rearing taught by elders.

h) finalized the location of IS

i) finalized staff training

j) finalized course outlines and delivery mechanism

Training

The staff at IS have received training from EATEP and The Prince of Wales Northern Heritage Centre. We have an on-going programme of training in museum technology, archaeological methods, curriculum development, the delivery of distance education systems and non-profit management.

The Museum Development Officer during this year will take six weeks of conservation training at the Prince of Wales Heritage Centre and a month of field training at the Heritage Society's Archaeological Field School. They have already received eight weeks of training in basic Museum Operations in Yellowknife, Fort Smith and Frobisher Bay.

The Educational Development Officer was trained at EATEP and has taught in N.W.T. schools. Both staff have taken the cultural instructors course offered by EATEP, ICI and McGill University (March 1986). They will both take two four week courses (funded by EDA) in non-profit management techniques (Michael Shouldice and Terrence Heath) and the design and delivery of distance educational systems (Jim McDiarmid).

Curriculum

The staff have designed the outline for Inuktitut Studies for the Keewatin High School and prepared complete bilingual lesson plans for grades 7, 8, 9 in Cultural Enrichment including cultural and language skills as well as land skills.

Final phase

During the final year the Pilot Projects will be delivered. The Child Rearing Course will be tested in two communities through the adult education centres. The display on Inuit clothing will be published and travel on a short itinerary to communities. The Learning Opportunities Programmes will operate at three levels a) Media Programmes (IBC CBC), b) Travelling Workshops and Displays, and c) One-on-One (Elders teaching locally).

The staff will be finished their training programmes and the Needs Analysis-Collections Profile will be submitted to an Architect. TFN should negotiate the capital for Inuit Silattuqsarvingat. Fund raising for year three will continue.

Contacts

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Note

The ICI was unable to send a representative to the ACUNS meetings in Yellowknife. We solicited this article in order to give this important institution some profile (ed).

THE METIS ASSOCIATION OF THE NORTHWEST TERRITORIES — A VIEW ON EDUCATION

Larry Tourangeau

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The Metis Association strongly believes that Natives should gain substantial control over the education of their children. This is one aspect of the larger objective that the potential of all our people should be fully realized. The importance of education is brought into focus when we consider that a Land Claims Settlement will bring new resources, responsibilities and opportunities to our people. The Metis will need knowledgeable, well educated people within the community to meet these new challenges.

Education is changing; the system that I experienced is different from the one that we have now. I would like to give you my recollections of education in the recent past, and discuss how it laid the foundation for my future and the future of others who went through that system with me. I will also tell you what I have been hearing about the present system and discuss its probable effect on the future of my children and the young people that I represent. I will also refer to the position taken by the Metis Association of the N.W.T. regarding the education of our young people.

My people were first exposed to a formal education system by the missionaries. Schools and boarding halls were built in certain communities in the Mackenzie Valley. It was the intention of the good missionaries to give the savages a basic education to guide them to the light of the true religion and to put an end to their traditional pagan ways of living. They used interesting methods to accomplish these ambitious objectives.

First of all, the missionaries transported Native children from their homes in the various settlements in the Mackenzie Valley to the locations where schools and boarding halls had been established.

Members of my immediate family and other relatives can remember travelling by boat and tug to Fort Providence, Hay River or Aklavik. They were herded into these boats like cattle and dropped off at the point where they were to be schooled, civilized and christianized.

When the students arrived, they were stripped of their clothes and given institutional clothes that made them look like prisoners. They were told their ways were evil and they were not allowed to speak their native tongues, which were denounced as languages of the Devil. The good missionaries also told the native students they had come to the North as instruments of God. In spite of their intentions, they enacted a program of Cultural Genocide that complemented the Government's Treaties.

It has been said that the missionaries were the ones who brought the North into the modern era. There may be some truth in this assertion, but it is also true that the missionaries who first came north could not have survived the harsh natural conditions without the assistance of the native people.

My education strongly influenced my upbringing and the way that I think today. The system under which I was educated refused to acknowledge the history and culture of my family and my people. This amounts to a policy of cultural genocide.

Here are some of the results of this misguided education policy:

1. The students began to lose their traditional ways;
2. There was a loss of identification with the parents;
3. The students were not able to live in the traditional lifestyle of their parents and grandparents; they did not know how to hunt, fish and trap;
4. The students forgot their languages and thus lost a very important communication link with the elders, which resulted in a weakening of the Heritage of the Native people in the Northwest Territories.

The missionary program produced confused and unhappy native people. They were indoctrinated with the history of the Commonwealth of Nations, the United Nations and the War to Free the Black people. All this was supposed to be important to the Native People of the Mackenzie Valley. We were also taught that the Indians were a detrimental influence in Canadian History, and that it was wrong to hold onto the Traditional and Spiritual beliefs that existed within the Mackenzie Valley Dene and Metis. Christianity was the only way.

Despite an oppressive education system, many capable Metis seized whatever opportunities were available, and we now have influential Metis working in business, in Government, and in our Native Organizations. This was only accomplished with hard work and perseverence. Let me tell you, that many Metis overcame adversity and have done well, and I salute their efforts.

I wish that the education system would fully utilize our elders in letting the young generation know the colourful history of the Mackenzie Valley. Our ancestors have received very little credit for their accomplishments. I feel that the education system should be refocused to teach the true history of the Mackenzie Valley. There is a lot of catching up to do.

Today our young people do need to be taught a good basic education that can be customized to meet the needs of the Northern Society and in our case to meet the needs of the Metis Association of the Northwest Territories.

We are at the stage where we hope that we can attract some of our top people. We need to because finally the realization of the settlement of our Land Claims is here. First of all, the planning phase for possible Land Claims Implementation requires our most knowledgeable and educated people. The influence that we now play in the

Northern political arena will require a developed human resource potential in the immediate future.

Our unwritten policy is to encourage our membership in their pursuit of higher education. Wherever possible, we have attempted to employ our Metis members who are attending university or other such institutions.

The Association of Canadian Universities for Northern Studies should take a practical approach in the quest for Northern studies. You should ensure that our Native history be a priority in the education system; You must work in conjunction with the true Northern interest groups to provide truthful research and when you teach your students about the North, remember that the Metis played a strong role in building the North and there is credit due to the ancestry of the Metis.

In closing, we at the Metis Association of the Northwest Territories commit ourselves to researching the truth in the History of the North. If all of us have the desire and intent, I am sure that our education system can complement our lives now and lay a good foundation for our young generation.

Note

The Metis Association of the NWT (MANWT) publishes a monthly newsletter which can be obtained from its Yellowknife address. Its illustrated publication "*Our Metis Heritage*" is to be republished. Readers are also referred to *The New Peoples* edited by Peterson and Brown, University of Manitoba Press.

This address was delivered by Harold Cook of the Metis Association in the absence of Larry Tourangeau (ed.).

.... mainly Research

FIELD FACILITIES IN ARCTIC AND SUBARCTIC CANADA

Peter Adams

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and

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This note is largely based on a publication (Campbell et al 1986) released at the ACUNS meetings in Yellowknife which resulted in the production of this volume. The publication is an inventory of thirty-eight major and fourteen minor northern field stations in Canada. These are listed in Table 1 and the locations of the major facilities are shown in Figure 1.

Canada's stations are placed in an interesting perspective in Kallio (1981). This is a description of and commentary on *biological* field stations in the circumpolar North (Fig. 2). It draws attention to the importance of such facilities for researchers who have to work in remote regions. Kallio discusses the advantages of particular locations for biologists, especially botanists. He brings out the contributions which some of the stations, particularly the longer established ones, have made.

As might be expected, his coverage of stations in northern Canada is not exhaustive even for biological stations (c.f. Biological Council of Canada, 1983, for a nation-wide coverage). However, his circumpolar perspective does draw attention to the (biological) diversity of sites of Canadian stations and to their vast latitudinal range. Canada's contribution at very high latitudes is quite remarkable.

It is not surprising that stations in North America tend to be less venerable than those in Eurasia, Greenland and Iceland. We do not have stations which were founded at the turn of the century, such as Abisko in Sweden. However, Kallio (1981) does not cite many of these, in part one suspects because longevity is not a common characteristic of field stations. When a station's region has been more or less "covered", or when the drive which led to the station's establishment has weakened, there is a healthy tendency for someone to board up the facility and leave, never to return often despite good intentions to the contrary.

Nevertheless, by the 1950's, a number of stations which still exist today, were becoming well established in Canada, including some at very high latitudes.

Arguably (Adams 1982), one of the most productive of these has been the McGill Subarctic Research Station at Schefferville, near the centre of the Quebec-Labrador peninsula (see Table 1). Established in 1954, this Station has been in continuous, year-round, operation ever since. It has been the base for work in diverse fields including archaeology, social anthropology, linguistics, medicine, permafrost research, ionospheric research, geology, geomorphology, varied fields of biology, glaciology, limnology, climatology, etc. etc. (see Moore 1985 and the McGill Subarctic Research Papers, McGill University, Montreal). It is a base for teaching as well as research. The persistence of this Station can be explained in various ways. These include its location (in the geologically interesting Labrador Trough, close to the centre of deglaciation of the Peninsula, near the treeline in the discontinuous permafrost zone, etc. etc.), the coincidence of the Station's development with the rise and (recent) fall of the iron mining town of Schefferville, access by rail and air but not by road resulting in a region which is accessible but still appears remote.

While Schefferville, at 55° N, is, as it were near the southeastern corner of Canada's North, two other stations also established in the 1950's are in the High Arctic by any standards. These are the Arctic Institute of North America's station on Devon Island and McGill University's other station, on Axel Heiberg Island in the N.W.T.

The Devon Island Station (AINA 1981) was established as a glaciological-oceanographic station, with additional studies in geology and geomorphology. In more recent years however it has become a major focus for varied biological work, especially that stemming from the Truelove Lowland which is an official IBP study site. This is essentially a summer facility although parties have overwintered there.

The Axel Heiberg Station was established by the late Dr. Fritz Müller (see Adams 1985 and the Axel Heiberg Research Reports series, McGill University, Montreal) as a base for multi-disciplinary research but with a glaciological focus. It is a summer facility, no one ever having overwintered there. A large amount of glaciological work has been published plus a great deal of biological, especially botanical, geological, geomorphological, climatological, limnological, etc. etc. work. Within easy reach of the station there is a variety of glaciers, (including one with more than two decades of mass balance records, detailed movement statistics and thermal data), a naturally acidified lake and sulphur springs. A bibliography of work from this station now running into many hundreds of items is to be published by McGill soon.

At another extremity of Canada's North, in the Yukon, the Arctic Institute of North America maintains its other

TABLE 1 — CANADA'S NORTHERN FIELD STATIONS
(addresses from page indicated in Campbell et al 1986)

TYPE (TYP): I = year-round teaching and/or research
II = seasonal teaching and/or research

MANDATE (MAN): F = fisheries, W = wildlife, E = earth sciences, H = human sciences, C = physical/chemical, G = general, O = other

HABITAT (HAB): O = marine, W = freshwater, F = forest, B = boreal, T = tundra, I = island, G = glacial

AFFILIATION (AFF): F = federal, P = provincial or territorial, U = university, N = native organization, O = other

ACCOMMODATION (ACM): O = not available, 1 = 1-10, 2 = 11-20, 3 = greater than 20

FACILITIES (FAC): O = not available, I = minimal, 2 = fair, 3 = extensive

AVAILABILITY (AVB): O = closed, I = restricted, 2 = open with some restrictions, 3 = open

	TYP	MAN	HAB	AFF	ACM	FAC	AVB	PAGE
NORTHWEST TERRITORIES								
Adams Island, 71N, 73W	II	F,C	O,I,G	O	1	1	2	3
Alexandra Fiord Post (R.C.M.P.), 79N, 76W	II	G	T	P,U	1	2	3	4
Arctic Biological Station — Field Camp, 64N, 69W	I	F	O	F	2	2	0	5
Arctic Ice Island (PCSP), 81N, 97W (moving)	II	F,E,C	I,O	F	1	3	1	6
Arctic Research Establishment, 73N, 78W	I	C	O,T	O	0	3	2	7
Borden Station, 74N, 82W	I	F,C	O,T	F,O	1	2	2	8
Chitty Lake Field Station, 61N, 114W	II	F	W,B	F	1	1	2	9
Coates Island, 63N, 83W	II	W	T	P	1	1	3	12
Devon Island Research Station, 76N, 85W	II	G	T	U	2	1	3	13
Eastern Arctic Scientific Resource Centre, 69N, 82W	I	G	O,T	F	2	3	3	14
Eskimo Point Arctic Research Centre, 61N, 94W	II	G	O,T	U	2	2	3	15
Eureka Aerological Station, 80N, 86W	I	O	T	F	1	1	2	16
Ikaluit Research Laboratory, 64N, 69W	I	G	T,O	F	2	3	3	17
McGill Axel Heiberg Station, 79N, 91W	II	E	G	U	1	1	2	24
Mould Bay Aerological Station, 76N, 119W	I	O	T	F	1	1	2	27
Nauyuk Lake Field Station, 68N, 108W	II	F	W,T	F	2	1	3	28
Nunguvik Arctic Centennial Station, 72N, 81W	II	C	O,T	O	1	1	2	29
Pearce Point Field Station 70N, 123W	II	G	T	F	2	2	3	30
Polar Bear Pass High Arctic Research Stn., 76N, 98W	II(I)	G	T	F	1	1	0(2)	31
Resolute Bay Field Station, 75N, 95W	II	F	W,O	F		3	3	32
Resolute Station (PCSP) 75N, 95W	II	G	T	F	3	3	3	33
Saqvaqjuac Field Station, 64N, 91W	II	F	O	F	2	2	2	34
Sarcpa Lake Field Station, 69N, 83W	II	G	T	F	2	2	3	35
Tuktoyaktuk Field Station, 69N, 133W	II(I)	F	W,O	F	1	2	2	37
Tuktoyaktuk Station (PCSP), 69N, 133W	II	G	T,W	F	3	3	3	38
Western Arctic Scientific Resource Ctre, 68N, 134W	I	G	T	F	2	3	3	40
YUKON TERRITORY								
Kluane Lake Research Station, 61N, 139W	I	G	B,T	U	3	3	3	19
NEWFOUNDLAND/LABRADOR								
Labrador Institute of Northern Studies, 53N, 60W	I	G	M,W,B	U	0	3	2	23
QUÉBEC								
Kuujjuaq Research Centre, 58N, 68W	I	F,W,H	B,T	N	0	3	2	20
Kuujjuaq Research Station, 58N, 68W	II	G	F,T	U	2	1	3	21
Kuujjuarapik Research Station, 55N, 78W	I	G	F,T	U	3	1	3	22
McGill Subarctic Research Station, 55N, 67W	I	G	B,T	U	3	2	3	25
MANITOBA								
Churchill Northern Studies Centre, 58N, 94W	I	G	B,T	O	3	3	3	10
Institute of Arctic Ecophysiology, 58N, 94W	I	G	O,W,T	U	0	2	3	18
Southern Indian Lake Research Station, 56N, 98W	I	F	W,B	F	3	2	2	36
Tundra Biological Station, 59N, 93W	II	G	T	U	2	1	3	39
SASKATCHEWAN								
Cree Lake Aerological Station, 57N, 107W	I	O	F,B	F	1	1	2	11
ALBERTA								
Mildred Lake Environmental Research Camp, 57N 111W	I	C	B	P	3	2	2	26

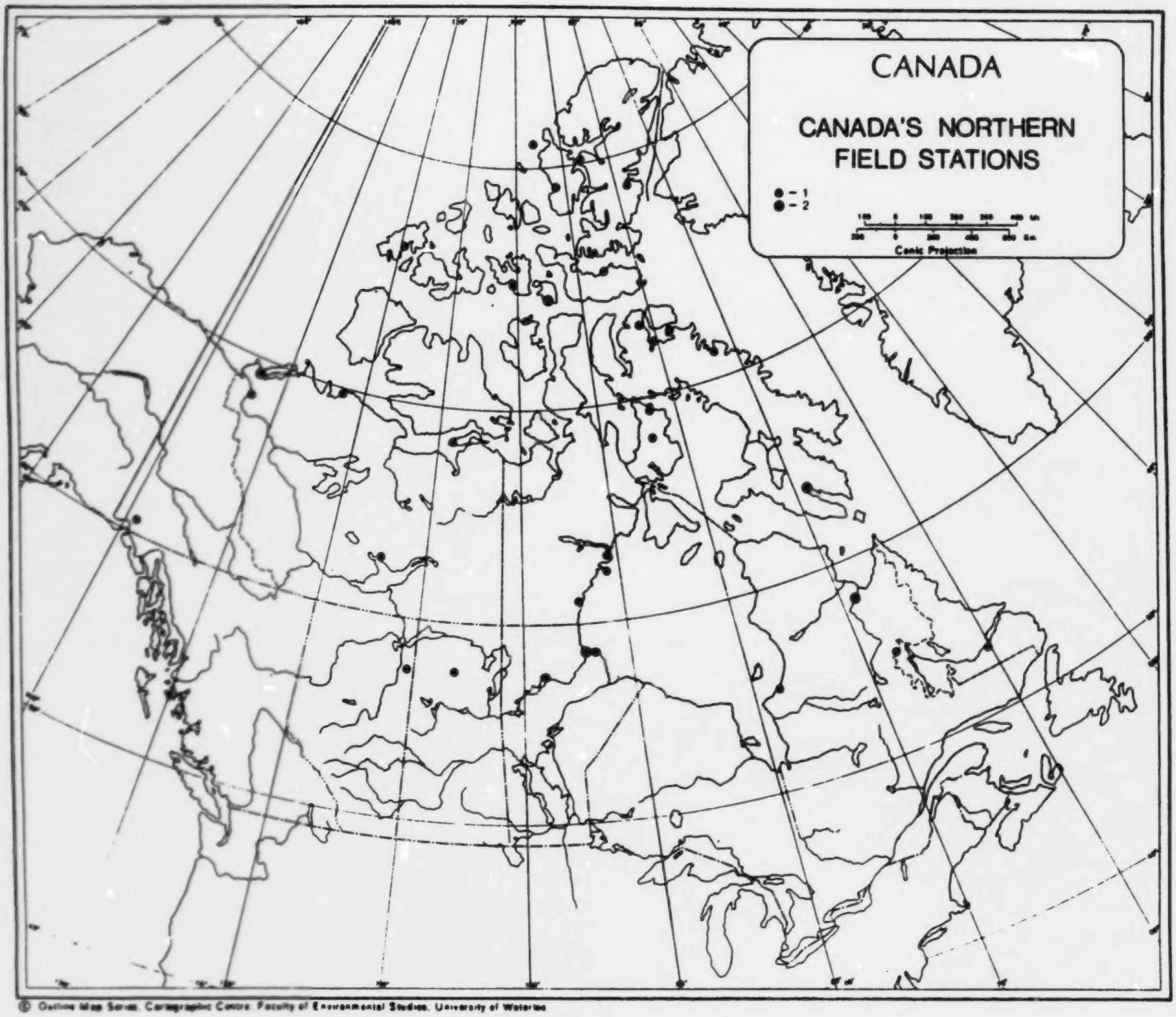

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Figure 1. Locations of field stations listed in Table 1.

station on Kluane Lake. This is a very sophisticated, year-round facility at the foot of the St. Elias Mountains. It provides access to a wide range of biological habitats from ice fields to boreal forest. It has been the base for very varied biological and physiological research, glaciology, archaeology, engineering, limnology, etc. etc. (see AINA 1983). It can be reached via the Alaska Highway and has its own aircraft.

All of the above are university stations. In the north-western 'corner' of the Canadian North is the Western Arctic Scientific Resource Centre located at Inuvik beside the Mackenzie Delta. This is an example of a different type of station, a well-equipped, year-round facility operated by the Department of Indian and Northern Affairs of the federal government. The others in this group are the Ikaluit Research Laboratory at Frobisher and the Eastern Scientific Resource Centre at Igloolik. A number of small outpost stations are associated with these facilities. The resources of the Inuvik Station provide a good indication of those at the others. It has fully equipped chemistry-soils-biology laboratories, cold rooms, libraries, visitors' office, greenhouses, etc. etc. with a sizeable year-round staff and good transportation facilities. The work at each station, naturally, varies with the nature of the region. Bibliographies of work completed are available (e.g. Castonguay and Sherstone 1985). The best central source of information on these stations is the Circumpolar and Scientific Affairs Directorate of the Department of Indian and Northern Affairs. A variety of detailed reports on the stations, including a cluster produced in the early 1980's, is available. Examples are Lewis 1981, Espie 1980 and Rode 1985. The stations are located in communities for which they are important resources.

Another, very different, set of government-operated facilities are the five stations of the Freshwater Institute, Winnipeg. These are Sagvaqjuac (near Chesterfield Inlet), Southern Indian Lake (northern Manitoba), the Resolute Bay Station (South Camp, Resolute), Chitty Lake (near Yellowknife) and Nauyuk Lake (Kent Peninsula). They

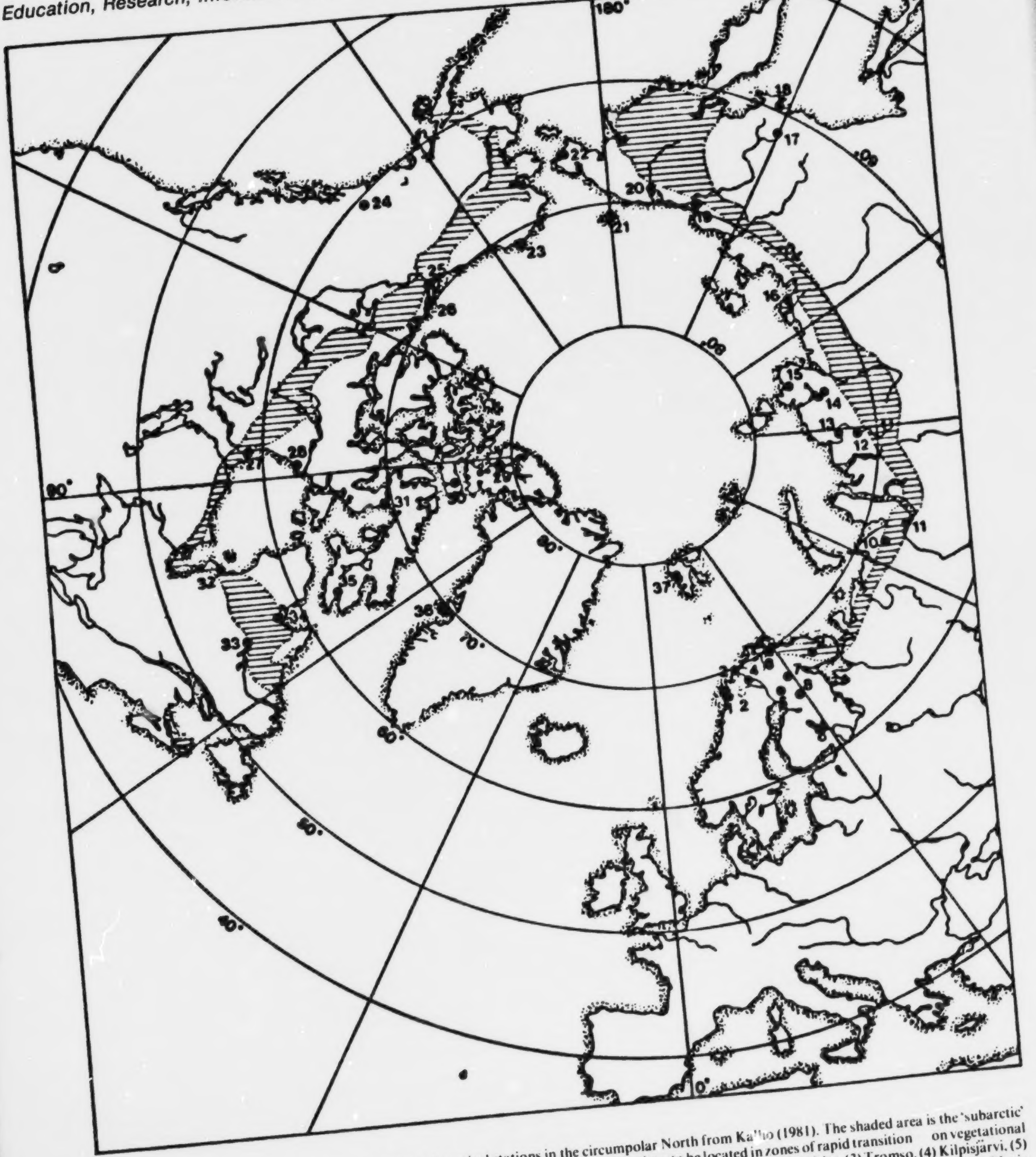

Figure 2. Locations of major biological, especially botanical stations in the circumpolar North from Kallio (1981). The shaded area is the 'subarctic' woodland zone between the tundra and the boreal forest. There is some tendency for stations to be located in zones of rapid transition on vegetational boundaries, rivers and coasts. From west to east, beginning in Scandinavia, these stations are: (1) Forsheim, (2) Abisko, (3) Tromso, (4) Kilpisjärvi, (5) Rovaniemi, (6) Kevo, (7) Värriö, (8) Oulanka, (9) Chibin, (10) Sivaya Maska, (11) Salekhard, (12) Agapa, (13) Tareya, (14) Ary-Mas, (15) Maria Pronchitsheva Bay, (16) Tiksi, (17) Aborigen, (18) Magadan-Sneznaya doline, (19) Pokhodsk, (20) Ust-Chaun, (21) Wrangel Islands, (22) Anadyr, (23) Barrow, (24) Kluane Lake, (25) Inuvik, (26) Tuktoyaktuk (27) Churchill, (28) Rankin Inlet, (29) Axel Heiberg Island, (30) Devon Island, (31) Igloolik, (32) Poste-de-la-Baleine, (33) Schefferville, (34) Kuujjuaq, (35) Iqaluit, (36) Disko, (37) Ny Alesund.

focus on freshwater, with some marine, research with a strong biological focus. They tend to be operated as seasonal facilities although Southern Indian Lake runs year-round. These stations have made a remarkable contribution to freshwater and marine science in Canada. An indication of this can be gained from the special issue of the Canadian Journal of Fisheries and Aquatic Science (1984) devoted to work undertaken from Southern Indian Lake station. Another example of a contribution to circumpolar fisheries research is Johnson (1983). Yet another is the freshwater work of Welch (Welch and Bergman 1985) who is now engaged in marine work at Resolute.

Two interesting *non*-government stations are Arctic Research Establishment (Pond Inlet, Baffin Island) and the Kuujjuaq Research Station (Kuujjuaq, Quebec). The former is a private operation which specializes in physical-biological studies (see H.A.R. Steltner, A Progress Report on the Arctic Research Establishment's Activities, Its Programs, Projects, and Main Experiments as of March and Covering the Previous 12 Years, *Northern Engineering: Organization and Policy with Report of the 1985 Conference*, ACUNS 1985, 71-76) involving Inuit personnel. The latter is the field station of Makivik Corporation, formerly the Northern Quebec Inuit Association. The Pond Inlet site is especially good for work focussing on the high arctic marine environment. It has a number of outpost stations for specific projects. The Kuujjuaq Station is particularly concerned with wildlife research and management issues of interest to the local people in a region located on the treeline.

However, the largest private facility in Canada is the Churchill Northern Studies Centre at Churchill, Manitoba. It can accommodate 50 people (20 in winter). It has well-equipped laboratories and teaching rooms and a library. It is the base for credit and non-credit courses taught by faculty from various universities in Canada as well as a base for research. The location, on the forest/tundra transition zone, near the mouth of the Churchill River on Hudson Bay is excellent for a variety of terrestrial and aquatic (marine and freshwater) biological studies, glaciology, geomorphology, etc. The area is famous for its polar bear studies. Churchill can be reached by train as well as by air. In its vicinity there are two other stations, the Institute of Arctic Ecophysiology and the Tundra Biological Station. The latter is particularly well-known for its bird, notably geese and duck, studies.

Another interesting "set" within Table I is formed of the three aerological stations operated by Atmospheric Environment Service, Canada (AES 1985). These are Cree Lake, Saskatchewan; Eureka, Ellesmere Island; and Mould Bay on Prince Patrick Island. These are year-round weather stations which can be used, with advance notice, by visiting research workers. Work from these stations is not restricted to weather. Research of various sorts has been carried out from them since 1946 (Met. Div. 1951).

Lastly, an interesting recent addition to the list of Canada's field stations is the Ice Island (see for example Jackson, 1986). This is a piece of shelf ice which at the time of writing is off the northwest coast of Axel Heiberg Island, N.W.T. During the next decade or so, it should move out into the Arctic Ocean and do a circuit of it. The Polar Continental Shelf Project of Energy, Mines and Resources, Canada, has established a runway and a number of buildings on it as the base for a variety of scientific projects. This is a station which has yet to come into its own.

My purpose here was not to describe all of the stations in Canada exhaustively. A great deal of information about the stations can be obtained from the references, Campbell et al (1986) and Biological Council of Canada (1983), cited at the beginning of this article. My purpose was rather to stimulate the reader to consider how the use of an existing facility might be of use to him or her. The stations are a national resource which tends to be under-used. Virtually all stations encourage cooperative, multi-disciplinary use but in realtiy, for quite natural reasons, they tend to be dominated by certain groups or individuals so that others tend not to consider them. It should be realized that a station which is primarily devoted to, say, weather or limnology may also be a good base for, say, archaeological or sociological projects. There is enormous scope for savings in the cost of northern research through shared use of such facilities and shared use of transportation to and from them, etc. etc. Many of the stations would benefit from quite modest long-term, advance, commitments from researchers or teachers. The NSERC of Canada is already, through its infrastructure grants program, encouraging cooperative use of such facilities (see elsewhere in this volume). Multiple use has academic benefits in an age when arctic researchers have increasingly to be aware of developments in fields other than their own.

Stations are of particular value as bases for teaching programs. Some, for example the Labrador Institute in Goose Bay, Labrador, regard teaching of local and 'southern' students as their principal function. The field stations which are in communities are especially good for teaching. They allow northerners and southerners to meet, work and learn together. Stations are also good for those, notably students, undertaking research projects in the North for the first time.

No field station is an end in itself. The work of each can only be measured in terms of work undertaken there, experience gained there. Canada has a fine network of stations which is often neglected by our northern teaching and research community.

I am most grateful to the late Gordon T. Campbell for his work on the inventory which is the basis of this note.

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THE ROLE OF THE PRINCE OF WALES NORTHERN HERITAGE CENTRE IN HIGHER EDUCATION IN THE NORTH

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The Prince of Wales Northern Heritage Centre is a museum — and much more. Established in 1979, it has earned a role as the senior institution of a developing network of community museums, archives and other programs extending throughout the Northwest Territories. We share the main goals of all museums: to collect, conserve, research, educate and exhibit. In our case, the subject matter is the natural and human history of the Northwest Territories. In pursuing these goals, there are many opportunities for interaction with universities and other institutions engaged in higher education and research.

Programs and services

The Prince of Wales Northern Heritage Centre houses a unique collection of programs and services, including the Northwest Territories Archives, an archaeological program, a heritage advisory section, and a full range of museum activities including collections management, conservation, exhibit design and production, and public programs. The purpose of the Centre is to increase knowledge and stimulate both enjoyment and participation in heritage activities throughout the Northwest Territories. There is a considerable challenge in serving an area of 3.4 million square kilometers, with a small population of less than 50,000 people living in 62 communities. Two-thirds of this population consists of Dene, Inuit and Metis, whose linguistic diversity includes five Dene languages and six major dialects of the Inuit language.

The exhibit galleries of the centre represent only one aspect of our work, albeit an important one. They outline the history of Canada's North, a drama of thousands of years of human adaptation and a mix of cultural traditions which continues to the present day. Over 20,000 visitors a year view these exhibits. A glance at our guest book shows that our visitors come from all parts of the world, as well as from across the North. In order to provide a "window on the world" for local visitors, we also display exhibits borrowed from other museums. In 1986 alone, we will host 12 travelling exhibits, and mount many small displays from our own collections.

Of course, the materials on display represent only a small fraction of the northern collections of the Centre. Our storage areas, which have environmental controls to enhance the preservation of artifacts, house many thousands of additional specimens. Highlights of the ethnographic collection include a growing collection of contemporary Dene decorative arts, a small but important collection of northern clothing, the only preserved mooseskin boat, over 1000 Baker Lake drawings dating from 1969 to 1973, and a complete set of the Inuit prints produced in the Northwest Territories since 1979. A large collection of Inuit sculpture includes early contact and acculturation period ivories and stone figures. The search for the Northwest Passage, arctic whaling, the development of government in the Territories and the delivery of services essential to the extension of Canadian sovereignty are a few of the themes represented by artifacts in our history collection. The natural history collection includes mounted and osteological specimens of animal species indigenous to the Territories, ore samples from mines and claims across the Territories, and paleontological specimens. In 1985, the Centre became an official repository for archaeological materials, and we now curate artifacts which represent many episodes in the prehistory of the North as well as the period since the arrival of Europeans.

The Northwest Territories Archives (see elsewhere in this volume), which derives its authority from the Archives Act of 1981, houses a collection of a somewhat different sort. The principal concern of the Archives is to collect the records raised by departments and agencies of the Government of the Northwest Territories which are deemed to be of permanent value. In addition to government records, the Archives seeks out and preserves records of private organizations and individuals who have played a prominent role in the history of the Northwest Territories. Until recently, much of the economic and other activity in the Territories was initiated by groups and agencies based outside Territorial boundaries, and this has resulted in what might be termed a state of absentee records. To the extent that its resources and the cooperation of repositories holding the original materials permit, the Archives is attempting to obtain copies of all significant documentation concerning the development of the Territories. The records, both public and private, come in many forms — textual, iconographic, and audio-visual, and document such activities as northern exploration, mining, transportation, native lifestyles, and the provision of government services. In addition to this unpublished documentation, the Archives Library has approximately 5000 published titles, with a focus on the human history of the Northwest Territories, including archaeology, ethnology and history. Included in the holdings of the Library is one of the best rare book collections on the North available in Canada.

Besides our major collections, we maintain an education collection of artifacts, specimens and photographs for activity programs, school loans, and for travelling exhibits which circulate to every community in the Northwest Territories. Because there are very few museums or cultural centres in the Territories, our travelling exhibits are specially designed for display in a variety of spaces from school hallways to offices, and for transportation by small plane, truck or car. Also, our Heritage Advisory Service administers training, planning and funding assistance programmes to encourage communities to develop their own heritage activities and facilities.

The Centre's Archaeology Programme has both regulatory and research responsibilities. It monitors land-based development to ensure that archaeological sites are not damaged, and issues permits which authorize archaeologists to conduct fieldwork in the Territories. In addition, the Archaeology Programme mounts field projects to rescue endangered archaeological sites, and to gather information about the prehistory and history of the Northwest Territories. It also administers the Northwest Territories historic sites plaquing programme to commemorate sites which have an important position in the prehistory and history of the Territories.

Staff in most sections of the Centre are actively involved in research, and publish their results in a variety of formats, including academic journals and monographs. Because serving northerners is an institutional priority, most of the Centre's own publications have been designed with a northern audience in mind. They include an *Occasional Papers Series* and an *Archaeological Reports Series*. Several video productions which describe our work are available, and more are in the planning stage.

Training northerners takes priority in every section of the Centre. We provide professional advice, assistance and guidance on request to individuals and organizations throughout the Territories. Staff archaeologists participate in courses offered through the Thebacha Campus of Arctic College, and conduct an annual field training programme designed to expose northerners to the methods and philosophy of archaeology. A northern internship program is also underway. Each internship is designed jointly by the Centre and the participant, and combines one-to-one instruction with practical experience at the Centre and in the intern's home community. The goal of the internship program is to create a core group of professionally trained northern residents who can participate in managing the rich heritage resources of the Northwest Territories.

Participation in higher education and research

The preceding section is a brief summary of our "in-house" endeavours, even though that house covers one-third of Canada. Many of these same programs provide services to southern-based researchers, and there are also opportunities to become directly involved in some of our activities.

Perhaps most important is the access which we provide to our collections. With only a few exceptions, our archival, archaeological, fine arts, ethnological and historical collections are all available for study, and in some cases may be loaned out. Part of our collection has been entered onto the National Museum of Canada's data base (the Canadian Heritage Inventory Network, or CHIN) and may be accessed by other institutions through that network; likewise, we can access the collections of other institutions through the CHIN system.

In addition to our internship program for training northern residents, we also welcome students in post-secondary institutions who wish to serve their practicums here, if their programs of study include this as a requirement. For instance, we are able to accommodate students undertaking a Master's of Archival Studies, and have had interns from museum studies and conservation programs do their practicums here under the supervision of our professional staff.

Undergraduate and graduate university students have also participated in our archaeology field programs in order to obtain data for honours, master's or doctoral theses. We have a formalized volunteer program through which we encourage university students who have access to research funds to work on our archaeological projects, and we have also offered research data to students who have undertaken field projects under contract to us. Often, this leads to one of the staff serving on the thesis committee, or in other ways committing large amounts of time to assist in seeing the particular research project through to completion.

Staff also assist in research projects initiated by southern researchers in many other ways, from serving as referees when proposals are submitted to granting agencies to reviewing the results of the research when it is submitted for publication.

Of course, we recognize that we gain as much as the outside researchers from these interactions. We see direct benefits accruing to the institution from such things as internships and having volunteers work on our field projects, and the networks that are established as we provide these services help to prevent staff from becoming isolated from the academic world, from which most of us have emerged. For these reasons, we encourage ACUNS members to build or strengthen ties with our institution.

There are other reasons for making this plea. One sign that we are doing our job well is the interest that some of the northern people who work with us on our projects show in pursuing museum or other heritage-related work as a career. All too often, however, these same people encounter roadblocks which prevent them from pursuing a profession through university training. This is one extremely important area where universities and northern institutions should work together. We are willing to motivate potential students on this end; in turn, we challenge ACUNS to find ways to open the doors to academia.

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ANTHROPOLOGICAL OBSERVATIONS ON SCIENCE IN THE NORTH: THE ROLE OF THE SCIENTIST IN HUMAN DEVELOPMENT IN THE NORTHWEST TERRITORIES

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Introduction

In combining basic research with human resource development, the scientist encounters theoretical and practical concerns which are not specific to a particular discipline. Science policy for the Canadian north will benefit if these concerns are addressed from many disciplinary perspectives. My intent in this paper is to present data on the social context of science in the Northwest Territories for the contemplation of present and future northern scientists. Both the philosophy and the practice of science are affected by the context in which we work.

The basis for this paper is experience as a participant-observer in the practice of northern science. The data are limited in comparability between groups of people involved, but come from work with students (Inuit, Dene, Metis, and Caucasian), academic peers, non-resident northern workers in several spheres, and work with 20 primarily native communities since 1975. Much experience, but not all, has been gained with an applied anthropology project, which serves as a case study to illustrate the problems and possible solutions discussed herein.

The direction of this research is towards an anthropological perspective on modern northern culture, and application of results to social and scientific problems. My current premises include recognition of a "colonial" view of northern Canada. This includes the fact that the Northern Territories lacks locally-generated revenue and thus lacks the power of self-determination within Canada (see, for example, Paine, 1977; *Études/Inuit/Studies* 1979:3(1,2): Dacks, 1981: 208-211). A second premise is that northern society comprises groups with different interests and different cultures engaged in dominant-subordinate cross-cultural interaction. The theory which provides some, albeit imperfect, explanation of the data is one of human adaptation to change, perhaps most simply termed cultural evolution.

The social context of science in the Northwest Territories

Northward Looking: A Strategy and Science Policy for Northern Development was released by the Science Council of Canada in 1977. A 1979 review of the report noted the failure of the Council to recognize the primary role of political, social, and economic factors in scientific and technological activities (de la Barre, 1979). Later, in 1981 the Canadian Social Sciences and Humanities Research Council (SSHRC) established a new strategic grants program called "The Human Context of Science and Technology" (SSHRC, 1982).

Historically, however, the sparseness and diversity of the Northwest Territories population (43,000 people of four major cultural origins scattered over one-third of Canada) have encouraged the isolation of researchers based elsewhere from the people of the Territories and their concerns. Furthermore, field scientists are often not sufficiently familiar with the social context of their work to be knowledgeable about the impact of their presence. Both the movement of aboriginal people towards self-determination and the pace and pressure of development mean that scientists are increasingly forced to face the concerns of residents and other interest groups in the Territories.

Gurston Dacks's recent political science study of northern Canada (Dacks, 1981) stratifies the Northwest Territories social structure into four major groups: native people, non-native northern residents, the government (both territorial and federal), and multinational corporations. Notably, the former groups consist of individuals while the latter are institutions whose members will not live in the north except in relatively small numbers and for the most part temporarily. Scientists working in the Northwest Territories are participants in its social context, but it is significant that they have no year-round base here. Thus they share with industry and the federal government the characteristic of doing work which affects the people of the Northwest Territories but primarily serves the interests of the dominant southern Canadian society. The isolation of scientists from the social impacts of their presence has sustained the treatment of the Northwest Territories as a research preserve for the outside academic community.

Two examples serve to illustrate some of the concerns northerners are expressing about science. The first is Recommendation 41 from the 1982 Northwest Territories Legislative Assembly Report: *Learning: Tradition and Change*. Education, seen as the means both to preserve the past and to control the future, was the subject of exhaustive community review, and major systemic changes may be implemented within the next few years. Recommendation 41 reads, in part: "Post-school programmes of the (proposed) Arctic College shall consist of activities currently undertaken by the Science Advisory Board; and the licensing of scientists for research in the Northwest Territories". This recommendation may merit little concern, but it serves to illustrate the interest northerners have in science, particularly as part of education.

The second example is that of Inuit concerns for archaeological research which have been published, presented before professional associations, and included in proposals for native cultural institutions (Swinton, 1976; Weetaluktuk, 1979; Inuit Cultural Institute, 1981). These include the need for Inuit involvement at all stages of research, including: selection of research problems; work on field programmes "not as labourers only" (Weetaluktuk, 1979); return of information in a format accessible to local people; consultation with regional and local people throughout a research project; and training and education in archaeology for northerners. Repatriation of Inuit artifacts to the north is also an Inuit Cultural Institute concern.

In contrast, the concerns of the scientific community might be summarized as: 1) continued access to data; 2) effective, conservationist management of data; and 3) research freedom.

The conflicting interests of N.W.T. society and institutions to the south yield a volatile context in which the researcher may be forced to respond to ethical and human concerns as well as to his or her own research problems. The practical problem today, for the scientists of any discipline, is that northerners are no longer complacent in accepting the dominant society which controls so many aspects of their lives. While they are subordinate both cross-culturally and economically, their quest to improve the quality of their lives affects the conduct of science.

Furthermore, the expressed needs of northerners conflict with prevailing norms for academic behaviour. We scientists, who have traditionally not been accountable to northerners for work done in the north, have not yet assimilated two facts. One is that we are ignorant of the skills necessary to participate in cross-cultural contexts, particularly so when technical information is communicated. The second fact, perhaps more important for this discussion, is that the changing social context of science may affect the practice of our disciplines, and perhaps even the theoretical foundations of our scientific interpretations, at least in the social sciences. How, then, do we participate in, learn from, and contribute to northern science which responds to human needs as well as to the needs of our own scientific quest for knowledge?

The Northern Cultural Heritage Project (NCHP)

The NCHP embodies the objectives of mutual education for the people of the north and for scientists, educators, and other interest groups, to the advantage of all parties (Cole and Bielawski, 1981). The project, which is a heritage education field school for Northwest Territories residents, incorporates archaeology and scientific skills training. It works towards two immediate goals: heritage resource conservation, and human resource development.

Begun five years ago (by the author and Sally Cole, Department of Anthropology, University of Toronto), the NCHP has had 37 participants (7-9 each summer, mostly Inuit but including whites and one Metis). Paleoeskimo materials have been excavated from one large, exceedingly complex site and one smaller site on Somerset Island in the central Arctic. Working for four weeks as excavators, mappers, photographers — that is, as archaeological field assistants — during the day, students attend a brief technical lecture each morning and classes or lab four nights weekly. Students are responsible for field notes, readings, and laboratory projects. The staff (three archaeologists and one cook/camp manager) is responsible for research, monitoring data collection, teaching on-site and in the classroom, informal counselling and teaching, and field crew and camp maintenance.

The curriculum covers standard field and lab methods, arctic prehistory and anthropology, and heritage. Modern northern society is discussed in the context of past and present human adaptations to environment and to other cultural groups. Students receive academic education, vocational training, and English and arithmetic upgrading. Most importantly, as field assistants they participate directly in research and work closely with scientists as role models. There is a strong "hidden" curriculum, based on the premise that a secure sense of one's heritage gives each individual a stronger, more adaptively successful sense of self in today's world (see also Cole, 1981). Thus we emphasize heritage education, and conservation of those aspects of culture which can be maintained within the context of the dominant society, such as language and values.

Most NCHP students have come from the small arctic communities of the N.W.T. They are recruited through regional schools and local contacts, and currently there is no requirement that they be enrolled in school. Through the recruitment process and the logistics of getting students to the field camp, many community people have become aware of and involved in the annual operation of the field site. Its broadly-based support has been slowly garnered piece by piece from the territorial government, the private sector, private family foundations, and certain federal government agencies such as the Polar Continental Shelf Project. This in itself furthers the project goals by involving many people and agencies from all sectors of scientific research, which is also done with and for northern people.

The project seeks the highest quality in research, education, and training, and a balanced integration of all three. Unfortunately, because funding has been minimal, the analysis of archaeological materials and the follow-up evaluation of participants have only begun. Directions for the future have been identified as: 1) placing skilled students as seasonal employees with field parties; 2) providing direction and support for those who may wish to pursue archaeology or other science studies; and 3) placing scientists and students interested in working together in contact with each other. The southern-based scientist and the northern student may have difficulty finding each other because few mechanisms exist for "local hire" at the community level, even when mutual interest exists. This may be mitigated through direct communication between researchers and community councils prior to the field season. A council, or another interested local agency such as the hunters and trappers association or a heritage society, could suggest potential field assistants. The scientist could hire field assistants when travelling through the community.

Three additional programs which involve northerners in science are currently in operation. One is the N.W.T. Science Advisory Board summer student program, which places individual students with field scientists who express a willingness to expose northern students to scientific work. The second is the Renewable Resources Technology Programme at Thebacha College, Fort Smith, N.W.T. It includes a rigorous two-year curriculum with field and classroom components, which exposes students to several disciplines. Third, the Prince of Wales Northern Heritage Centre included a training component in a Mackenzie Delta archaeological project begun in 1983.

Optional public work for researchers

Policies and guidelines for northern research consistently stress the need for local, particularly native, involvements in scientific activities (Science Council of Canada, 1977; Social Science and Humanities Research Council, 1981; Department of Indian and Northern Affairs, 1981). Yet, experience with NCHP shows that despite objectives of mutual education for the public and scientist, the results of the project have been felt largely by individual students and their communities.

Several other means exist through which researchers could respond to the northern social context. Pursuit of the following options would allow researchers to become more active in the cross-cultural research and education process.

1. *Non-technical, graphic, and translated information* is required, information which reaches people and with which they are comfortable. While in no community in the world do we expect the average person to be aware of the latest scientific advances, in small native communities the impact of the researcher's presence is much greater than in cities. Hence, information return is more important. An indirect approach through increased northern science training for teachers (including adult educators) and through upper-level curriculum materials is potentially fruitful. Teaching units on scientific projects done in the area may return more research results to communities than does deposition of untranslated reports with local councils. The latter works for formal interaction but seems to do little to inform most people. Mounted photographs with brief, general, translatable captions, designed for display in community centres, are very useful.

Conferences held in regional centres, where every effort is made to encourage public involvement, are also an excellent means through which to transmit information to the public. Local residents participated in a recent heritage conference in Haines Junction, Yukon, and in public historical presentations at the meetings of the American Association for the Advancement of Science (Arctic Division) in Fairbanks and Whitehorse. Conversely, the annual Elders' Conference organized by the Inuit Cultural Institute of Eskimo Point, N.W.T., invites workshop participation from northern researchers.

Problems faced include: a lack of skilled translators; the fact that research grant allocations do not include a commitment of funds for production and translation of non-technical, graphic materials; and the lack of an effective means of distribution to the public.

2. *Role models* for work other than in settlement maintenance are needed in communities. Because field science

takes place "on the land", in a context with which local people are familiar, scientists can contribute greatly to broadening the horizons of northern residents. With role models, and job incentives for at least seasonal work with field parties, reinforcement from one's home culture for such work may grow. Work as a field assistant also provides employment which may merge with other cultural needs, such as the part-time maintenance of a traditional subsistence life-style.

A scientist-in-residence program in rural Alaska is providing role models for students both at their high schools and in a summer student intern program similar to that of the N.W.T. Science Advisory Board. University of Alaska scientists spend one week at a rural high school working with students and teachers, using "culturally and environmentally relevant materials" (McDiarmid *et al.*, 1982:79). This program is aimed at "increased academic performance by students in the sciences and increased minority representation in the scientific professions."

3. *Education for the novice scientist* is required. University student field assistants often travel directly from their university to field sites. This route lacks physical or intellectual exposure to any northern context save that of science with, by, and for scientists. Thus, future northern scientists are not encouraged to become familiar with the complexity of influences on science, nor with the relationship of science to northern people. In order to introduce the issues surrounding management of data bases, and access to data, universities might consider offering research context, or even ethics, seminars as part of the graduate curriculum. Such seminars could cross disciplines and consider land use and research permit systems, legislation, community contact, information return, and cross-cultural perceptions of science. Students of one discipline could also study the north in comparison with other world areas posing similar contexts for scientists. Both the researcher and northern residents should benefit, the scientist having facilitated his or her work through prior knowledge of the issues and systems which affect it; northerners, through sensitively conducted and successfully applied research.

4. *Participation in policy development* is required. In the Northwest Territories, political evolution will probably result in governing bodies more culturally cohesive than the present structure. An Inuit-dominated eastern territory, and a western territory in which Dene, Metis, and non-native permanent residents are the controlling forces within government, may mean more territorial control of scientific activities and pressure for research which serves northern interests. The current activity being devoted to development and implementation of arctic and Alaska science policy is a process which northern Canadian researchers could do well to follow and study. As a group with special interests, we need to participate in the evolving management and legislative structures of the Territories.

Such participation first requires accepting the fact that we are not conducting research in a vacuum. Discussions of the social context and its implications for northern research could be included in professional conferences (e.g., see Bielawski, 1982a, 1982b; Janes and Arnold, 1983). Professional associations could address the impact of scientific work and scientists' presence in northern communities and on the land. Information on the allotment of research funds for educational components for northerners, and for writing, translation, and distribution of general research results to the public should also be circulated within the scientific community.

Advocacy committees within professional associations or institutions such as the Arctic Institute could work to make policy decisions affecting researchers known to the scientific community. Scientists, in turn, could collectively work with government management agencies to ensure that the needs of the scientific community continue to be met within the changing political structure.

Problems with options for researchers

The researcher and the public face several problems in bridging the gulf between cultures, and that between academics and the public. There is no tradition of cross-cultural communication between academic institutions and communities. Hence the skills, procedures, and positive reinforcement for it are in short supply. Currently such communication occurs on an individual basis, and slowly, and there is much frustration on both sides.

Two problems predominate. In the local community, there are relatively few skilled and experienced individuals to deal with the overwhelming burden of projects and agencies demanding their attention. Concern with community health, employment, education, political evolution, and large-scale development projects is greater than concern over relatively small-scale field research, although research may be done to advance knowledge of these concerns.

For researchers, the single largest problem faced is that there is little, if any, professional incentive to address the social context of their work in the north. This means that scientists perceive a lack of time to pursue any of the options described earlier, such as overseeing the translation and distribution of non-technical reports or photo stories. It takes a commitment of the scientist's time to select appropriate research results and make them available to curriculum developers or museum education departments, so that school materials can be produced. It takes time for the scientist to volunteer (as did University of Alaska researchers) to spend several days in a rural Alaskan high school. It takes time and patience to explain scientific research to a lay audience in person and in correspondence, and even more time to do this for a native community. Because this work does not fall into the major categories of research endeavour — publishing technical papers and reviews, university teaching, administrative duties for the scientist's institution, and participation in professional associations — which are the academic measure of a researcher's work, addressing research results to northerners has been a low priority for most researchers.

To summarize these problems, even when scientists and northerners seek to exchange interests and information, neither group perceives immediate benefit from doing so. Both groups find obstacles to developing communication.

Yet, since the NCHP began in 1979, all of the options described above have been pursued by workers on the project. Photo stories and translated accounts of the work have been distributed to Resolute Bay, to participants, and to other interested individuals and communities. A story line using an archaeological dig to introduce general science concepts was produced under contract for the N.W.T. Department of Education's curriculum section. Community visits, including several slide shows, were an annual feature in Resolute Bay during the project, and preliminary laboratory analysis was conducted there for six weeks in fall 1980. By working closely with students in the field, training them as assistants, and carrying out analysis in view of the community, NCHP workers have tried to present role models for northern students. The NCHP has also encouraged novice scientists to become familiar with the northern social context through hiring staff demonstrating ability and interest in working within the NCHP's cross-cultural research setting: through extensive correspondence with senior undergraduates and graduate students in various disciplines; and through seminar presentations in graduate departments. Finally, in policy development, the NCHP has worked to raise northerners' concerns about archaeology within the profession (see Bielawski, 1982b).

Theoretical implications for social science

I conclude with the possibility that cross-cultural approaches to research might have theoretical implications for social science. This is suggested and supported in Daniel Miller's throught-provoking discussion of archaeology in a developing country. Miller (1980:710) emphasizes that archaeology is a product of industrialized cultures and the European scientific tradition: "there is nothing in most traditional societies that in any way parallels it ... its methodology, paradigms and context are all unprecedented ...". Because archaeology is both a collection of concepts derived from a contemporary scientific world view, and a discipline which seeks to understand the past of diverse cultures, "in order to become meaningful it must become an integral part of the developing system ... and cross the boundary to become identified with many important aspects of traditional life and outlook" (Miller, 1980: 710).

Miller's experience and analysis clearly demonstrate that research in the European scientific tradition is alien to aboriginal, developing cultures. He suggests that cross-cultural archaeological research incorporate the concept of dualism, which recognizes the existence and validity of both traditional and contemporary social and economic systems in developing countries. Only through integration with traditional world views will archaeology — and thus preservation of archaeological resources and knowledge about past ways of life — take root and grow within developing cultures.

McGhee (1980:720), in commenting on Miller's synthesis of pragmatic and theoretical issues, expresses concern that opening the traditional stance of archaeology to research designed in the context of other cultures may lead to uncontrolled excavation and overly subjective interpretation. On an empirical level this is a valid concern. Archaeologists and other scientists must continue to develop and adhere to sound principles of data conservation and management. On a theoretical level, however, the existence of emic and etic perceptions recognized in anthropological views of other cultures supports Miller's conclusions. Simply summarized, emic categories of knowledge are those defined within the reality of the other native cultures; etic categories are meaningful to the researcher in terms of our culture's scientific theory. Miller's description of the discipline of archaeology as separate from the cultures within which it is often conducted holds true for many sciences. Researchers in the social sciences, however, are beginning to respond on a theoretical level to the accumulation of data collected over the past century from aboriginal cultures. While an empirical response has been evident in the applied branches of science (technology, medicine, social services) only recently have we begun to see the flow of observation and interpretation from native cultures into the dominant scientific world view.

This flow is evident in Miller's synthesis of academic and cultural concerns and experience, on which he bases his argument for incorporating dualist world views in archaeological research. In northern studies, it is very evident in the recent spate of published comments on the integration of academic and applied science concerns, particularly in Kemp and Brooks's "A New Approach to Northern Science" (1983); (see also Harrison, 1983; Upton, 1983; and Dr. W. Taylor, Jr.'s comments on assuming the presidency of the Social Sciences and Humanities Research Council of Canada (Anon., 1983)).

This integration of cross-cultural perspectives with modern science cannot help but engender a shift in the direction of the pursuit of knowledge. It may see changes at the empirical level regarding what constitutes observation and data, while on the theoretical level it could reveal new foundations for analysis and explanation. Although, as the above-cited comments demonstrate, such a shift is occurring, the implications of this shift will take some time to become evident.

The crucial concerns, of course, are the nature of reality, truth, understanding, and knowledge, and the validity of multiple cultures' definitions of these. The following question might be considered by workers attempting to disseminate concepts and results of scientific research, and by native groups; the relative success or failure of data access and management may prove the measure of our response.

If a concept or world view provides explanation for observed phenomena, is it not valid and true according to the criteria of modern science? Thus, if an interpretation provides explanation about observable phenomena in the environment to members of a native culture, is it not true? Though the answer is yes, it must be qualified: perhaps it is only true within the terms of reference of that culture. However, if the explanation can contribute to explaining phenomena observed beyond that culture, it is a contribution to human knowledge. As such, it must be considered an addition to the sources of general scientific explanation and incorporated into the body of scientifically researched truth as we presently understand it.

Finally, as the people of the world become more and more integrated into a global cultural system based on at least some shared knowledge of events, environments, and phenomena, all cultural definitions of science and truth become raw data from which human knowledge continues to emerge. Furthermore, all culturally defined, but not culture-bound, paths to the explanation of phenomena observed around us — that is, culturally different methods of research — might be considered equally valid until proven to yield fallacious results or no results at all.

Summary and conclusions

As scientists in a cross-cultural context, our practical roles are twofold: 1) to seek knowledge; and 2) to impart knowledge and expertise to those who wish to know what we have learned, in a manner which effectively crosses cultural boundaries.

In so doing, we can facilitate both science and education by meeting needs for academic and vocational study, employment, and role models. We also uphold our responsibility to science through pursuing knowledge and ensuring access to data and research freedom. Finally, we must meet the ethical responsibility to the public embodied in applied science.

Research might be defined, most simply, as problem definition and the search for solutions. Let us, in applying social science, consider this question: in cross-cultural human resource development, is there a need for research which utilizes fundamental concepts defined in the terms of subordinate as well as dominant cultures? Considering the diversity of human cultural knowledge, if we accept the broad evolutionary concept that generality is more adaptively successful than specificity, we might consider incorporating the richness of cross-cultural perceptions into the advancement of science.

Acknowledgements

Sally Cole and I began the Northern Cultural Heritage Project in 1979. It has grown into the non-profit Northern Heritage Society, based in Yellowknife. My experience with the project was the impetus for this paper. The project has been supported by several departments of the Northwest Territories Government, especially the Prince of Wales Northern Heritage Centre; and by the Polar Continental Shelf Project; the Boreal Institute for Northern Studies; the Donner Canadian Foundation; the MacMillan Trust of British Columbia; The Arctic Institute of North America; Giant Yellowknife Mines; and Petro-Canada.

Sally Cole, Paul Parker, François Kense, Bob Bell, Dan Billing, Frances Abele, Ben Hubert, and Cliff Hickey aided me in the development of this paper, as did the comments of two reviewers. It was originally presented at the 33rd Alaska Science Conference in Fairbanks, September 1982, which I attended with the support of the Government of the Northwest Territories. The responsibility for the views presented is mine alone.

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Note

This paper was reprinted here because of the great interest in roles of science in the North which was apparent in ACUNS' Yellowknife meetings. The paper by Bielawski on the Northern Heritage Society, elsewhere in this volume, was one of those which triggered this interest. We are grateful both to the author and Arctic for permission to reprint.

THE DEPARTMENT OF RENEWABLE RESOURCES, NORTHWEST TERRITORIES — ITS RESEARCH PROGRAMS AND ITS INVOLVEMENT WITH UNIVERSITIES

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The Department of Renewable Resources is responsible for the management of terrestrial wildlife and wildlife habitat under the NWT Wildlife Act, and the enforcement of pollution control measures under the NWT Environmental Protection Act. It also enforces federal regulations on fish, marine mammals and migratory birds under the Fisheries Act and Migratory Convention Act. Currently we are negotiating with the federal government for the transfer of forest management to our department.

We have a staff of 137 people distributed throughout the territories in five administrative regions and in our Yellowknife headquarters, many of whom participate in our various research activities. These activities are directed towards the following goals:

- to maintain diversity and ensure long-term productivity of renewable resources for the benefit of NWT residents and in relation to national and international interests;
- to maintain and enhance environmental quality;
- to increase the involvement of residents in renewable resource management consistent with aboriginal claims agreements.

Research programs

The Wildlife Management Division is responsible for identifying resource development opportunities. Its research is directed towards maintaining productive populations of native wildlife in their natural habitat and ensuring that any development, or use of the land, does not impair the land's capability to support wildlife.

The most important species to the residents of the N.W.T. is the barren-ground caribou. Considerable money and effort is expended in determining the population status of the different herds. This is done by means of aerial and ground surveys, and aerial photography of calving grounds. Seasonal movements of individual caribou are determined from tagging and radio-telemetry programs.

The status of our polar bear populations has been studied for several years largely by means of live-capture, tagging and release programs. It takes 3 to 5 years to assess a local population through tagging and returns provided by hunters. The Baffin Bay-Davis Strait subpopulation study has recently been completed and we are now involved in a co-operative study of the Foxe Basin-Hudson Bay subpopulation. We are also cooperating with the Canadian Wildlife Service and the U.S. Fish and Wildlife Service in monitoring polar bears in the Beaufort Sea by means of radio and satellite transmitting devices. Since the polar bear is at the top of the marine food chain, it is being used to provide biological samples to assess environmental contaminants in conjunction with other studies on chemical residues in native foods.

Population and habitat studies are being conducted on muskox, moose, bison and gyrfalcons to develop an effective management program for these species. Bear detection and deterrent studies are directed at both conserving our bear species and protecting humans from bear encounters. We are also involved in mapping wildlife distribution, classifying wetlands and conducting a resource inventory of Auyuittuq Park on Baffin Island.

Some of our research takes place in response to industry requiring permits for exploration and potential development of minerals, oil and gas. Our caribou research on calving grounds in the Baker Lake area was in response to uranium exploration and the need to establish caribou protection areas. Currently we have several base-line studies on wildlife in the Beaufort Sea and lower Mackenzie River areas in response to potential hydrocarbon developments sponsored by the Northern Oil and Gas Action Program. Several of these studies are in cooperation with other agencies such as the Yukon Government, Canadian Wildlife Service and the U.S. Fish and Wildlife Service.

We have a special agreement with the Canadian Wildlife Service which allows their personnel to work in the north, to have input into our projects and to share their expertise with us.

Currently they are involved with population studies on Peary caribou, polar bear, and the effects of forest fires on the winter distribution and condition of barren-ground caribou.

Our Field Service Division is responsible for fur management and is involved with the Fur Institute of Canada in studies on humane trapping methods.

Our Pollution Control Division is responsible for the prevention of environmental damage. It works closely with other agencies in developing studies to map terrestrial and aquatic areas sensitive to acid precipitation and other aerosol depositions. Other studies are being done to detect concentrations of radio nucleides at abandoned mine sites, arsenic from gold mines in the Yellowknife area, and hydrocarbons in the Mackenzie River near Norman Wells.

Involvement with universities

Educational leave for employees: The Department is currently supporting three employees on educational leave for graduate studies at southern universities. The Department will pay partial salary and tuition during the leave and guarantee a job upon the student's return. The benefits to the student are that he is able to do intensive work in his area and obtain a degree. The university benefits by its contact with the North and the research which is carried out. The biologist in charge of the project benefits from the concentrated help he has on projects that he may not otherwise have manpower or funding for. At the same time a line of communication has been established between the university and the Department.

Employment and support of graduate students: Financial and logistic support is provided for university students retained for special projects. Currently four graduate students are employed to help with bison studies in the Mackenzie Bison Sanctuary. Research costs are provided by our Department while the students themselves provide living costs. We benefit from fairly inexpensive manpower provided by people with a vital interest in the project and the students benefit from the opportunity to work in the North and do research that would not be possible elsewhere. Similarly we are supporting graduate studies on polar bear and peregrine falcons. In some instances members of our department act as thesis advisors and serve on the thesis committee. Occasionally when special expertise is required we may contract university staff and students to complete the task.

Employment of under-graduate students: The Department hires undergraduate students to work on summer programs. These are northerners who are paid at a training rate and have the opportunity to work on a variety of field projects. Although the Department does not actively recruit students at universities, it does send personnel to high schools in the North to encourage students who will be attending university to apply for future summer jobs.

Our Affirmative Action program will soon allow the Department to assist northern students even more by enabling us to hire them on a long-term basis as trainees and assisting them with higher education.

Relationship with universities

Obviously our Department maintains much closer ties with certain universities than with others. The University of Alberta is a case in point because of its affiliation with the Boreal Institute for Northern Studies and because of programs with a specific interest in the North, as well as the obvious fact that Edmonton is our first stop in the south. To some extent our ties also depend on our biologists who look back to their own universities when recruiting students, staff or contractors. Currently we maintain close ties with UBC, and the Universities of Alberta, Guelph, Saskatchewan and Manitoba. As more students from the North are attending other universities we continue to develop "old boy networks".

Relationships with institutions such as the University of Saskatchewan exist because of certain unique facilities. The Western College of Veterinary Medicine is the regional centre for veterinary expertise and training serving the four western provinces and Yukon and the Northwest Territories. It is also home to 18 muskoxen from the Northwest Territories. In 1983 our Department supplied 13 muskoxen to the college to be used for research on reproduction and other studies. The N.W.T. retains co-ownership of the muskoxen, and both our Department and the university benefit from the research.

Recently our Minister contributed $3,000.00 to support graduate programs in wildlife diseases at the Western College of Veterinary Medicine. The Wildlife Health Fund, which is supporting the programs, hopes to raise $25,000 — $30,000 to support two graduate studies programs in wildlife diseases. A representative from our Department sits on the board of directors and participates in decisions as to how the money is used.

A certain amount of independent work is carried out in the Northwest Territories by researchers who may or may not have some affiliation with a university. Our Department retains control over such work to the extent that all researchers must apply for a Wildlife Research Permit before beginning their work. The purpose of the permit is to maintain updated records of wildlife work in the N.W.T. and to ensure that local Hunters and Trappers Associations within the study area are aware of the proposed research and can make recommendations on the application.

A report of the work must be forwarded to the Department at the end of the season. Thus we gain information in areas that might otherwise not be investigated. We have encountered some problems with maverick researchers who refuse to apply for permits but generally most abide by our policies and find that benefits accrue to themselves as well as to our Department. The logisitics of doing any kind of work in the N.W.T. are frequently underestimated and southern researchers may need the experience of Departmental personnel even to find their way into the field.

Conclusion

I have discussed here a few of our programs and some of the ways we make use of universities. It is fairly clear from most of the examples that our connections with universities are generally on an individual basis. What we need to do is establish some means of working with outside institutions on a more regular basis and make some arrangements whereby we can share knowledge and even personnel with universities. We also need some means of updating our information on what research is being done in universities and letting university personnel know what we are doing and what research we would like to see done.

The Northwest Territories presents unique opportunities for researchers in the field of renewable resource development and management. We do not have the manpower, nor the money to do everything we would like to do. We need to work with the universities and use the special facilities and expertise which they have to offer. In return we can offer our expertise and our position as a "gateway" to the North to those universities with an interest in the resources of the Northwest Territories.

Note

The Department of Renewable Resources, GNWT, has a number of series of publications including Completion Reports (major completed studies), Contract Reports, Information Reports, Wildlife Notes and Pamphlets. A publications list is available. Examples are: Lower central Arctic Islands polar bears and Mackenzie Mountain grizzly bears (Completion Reports #1 and #2), Baffin caribou, summary and analysis of tag returns 1974-84 (Progress Report #10), the Arctic Wildlife Sketches (series of Pamphlets on major species) and Firearm Safety in the N.W.T., 1985 (Wildlife Note #24). (ed).

PUBLIC WORKS AND HIGHWAYS, GOVERNMENT OF THE N.W.T., RESEARCH ACTIVITIES AND NEEDS

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I would first like to clarify that I am with the Department of Public Works and Highways, of the Government of the N.W.T., *not* Public Works Canada.

I am neither scientist nor educator and so the reader might ask why someone from Public Works delivered a paper at and participated in meetings on Education and Research in the North which resulted in this volume. Even though we in the Department are not scientists or educators, we believe that the work that we do very much impacts upon science and education in the North, and very greatly impacts upon northern communities and the quality of life for northern people. I would like to speak to you in respect to the development of northern buildings and works technology (Arctic Engineering) that we are involved in.

I planned, in my presentation, to speak to the need for a greater *Northern* focus or forum for northern science; my particular concern being in buildings and works technology. I still believe that there is this need. However, after being present and hearing all that was said at the conference, I realize that I still have a good deal more to learn, particularly about the great many things that are happening in the areas of northern research and how this complex array of activities could be brought together. Therefore, I will remain silent on that issue for the time being.

Some time ago, I approached Dan Billing and Bob Janes, of the Science Institute of the N.W.T., to express concern that my staff, most of whom are architects and engineers with many years of Arctic experience, are always going South to seminars on Arctic engineering, construction, and such topics. That concerns me because those very same people, through their day to day experiences, are developing a wealth of information in those fields and so they should be encouraged to give seminars on those topics.

Most of us in the engineering and architectural fields, who are living and working in Canada's North, are users of the information that university researchers produce. At the same time, however, because we are working in a frontier, we are developing new technology in our designs and construction procedures. This information, beyond meeting our immediate needs, is not being made available to others who might be able to use it.

I also expressed to Dan and Bob my concern that, while we are doing this work, we have very little contact or coordination with the many universities carrying on engineering research and education. I said that I felt that we needed some sort of a forum to better promote and coordinate the activities of universities with the practising engineers and architects in the Arctic. They suggested to me that if I had something to say, perhaps I should say it to ACUNS, hence this paper.

I do feel that we, in the Department of Public Works and Highways, have something to offer in Arctic Engineering, Research and Development (R & D). I believe that there is much that ACUNS' member universities, in their research and study programs, can do to assist us in our work.

I would like to quote from a recent document produced by the School of Engineering at the University of Alaska, Fairbanks, entitled Arctic Research Needs in Civil Engineering:

> "Information transfer is, as it always has been, a problem. Information transfer is essential if we are to apply research results to engineering planning and design and to place the results of research in a form useful to the practising engineer.
>
> Although research information is easily available from various sources, no comprehensive programs exist that ensure a potential user of finding the most current research information. This information is available to a dedicated researcher familiar with the sources, but not to the practising engineer.
>
> Because of the unique conditions often encountered in engineering in the north, many innovative designs and technologies are developed by practising engineers. Currently, there is no mechanism for distributing this information to other potential users. This type of information, although not truly classified as research, represents a large area of knowledge untapped by the northern engineering community."

I think that that describes rather well some of the main concerns that I was expressing to Dan and Bob.

I would like, here, to describe to you what it is that the Department of Public Works and Highways is doing in the areas of Arctic engineering and architecture, the kinds of research and development that we are promoting, and where we could use ACUNS' assistance and cooperation. At the same time, I would like to suggest that we could be of assistance to universities in providing a vehicle for some research efforts.

On our staff across the N.W.T., we have in excess of 100 architects, engineers, and technical officers engaged in the practice of design and construction of our facilities. Most of these people have been in the Arctic for many years and so have accumulated a wealth of experience and knowledge.

Some of the facilities that we build and operate are:

- Schools and Hostels
- Office Buildings
- Housing
- Recreation and Community Halls
- Correctional Facilities
- Reservoirs
- Water and Sewer Systems
- Fuel Facilities
- Highways, Bridges, and Ferries
- Winter Roads
- Ice Bridges

Our annual design and construction budget is in excess of 70 million dollars per year, and our operations budget is in excess of 120 million dollars. Our program encompasses hundreds of different types of projects spread across the N.W.T.

In his talk to the NOIR Seminar (in this volume), Dr. Nelson spoke about the problems of finding funding for research. Well, I would like to suggest that the capital and operating programs that we carry out in the north could provide your students and researchers with a great many opportunities to conduct research in the north, without great expense. At the same time, they could be working on and assisting us in solving our current problems.

I would like to briefly describe to you some of the "research" activities that we are currently conducting.

For example, control of ice in our northern rivers is an area of concern because of the fact that we must use ferries to connect our highways. We currently have a research project underway with someone from the University of Alberta, to study river hydrology, to determine how best to keep docking basins free of ice and the best method for keeping a channel cut in the ice.

All of our building projects must take into account the effects of snowdrifting if they are to be usable. Consequently, we have sponsored many snowdrifting studies with the University of Guelph.

Working with many resources such as the National Research Council, Canada, and consultants we have developed what we think are practical and cost effective solutions to building roofing, envelope, and foundation problems.

Some years ago, we cooperated with other government agencies and universities in the development of a Cold Climates Utilities Design Manual. Through the efforts primarily of Dr. Dan Smith of the University of Alberta, this manual has recently been revised and is now in its second printing. The Department of Public Works and Highways is financing the production of the document. After recovery of the cost of production from monies received from its sale, the remaining funds will be used to support R & D through a joint agreement between ourselves, Canadian Society of Civil Engineers and Environment Canada.

We are currently participating in the Canada-USSR Arctic Science Exchange Program (of Indian and Northern Affairs, Canada) for the purpose of exchanging information on northern construction technology.

Under the joint Federal/Territorial Energy Demonstration Agreement, we sponsored in the N.W.T. several different types of technology demonstration projects. One which has particular significance, and which has seen development of state of the art technology, has to do with the recovery of waste heat from power generators and other mechanical equipment.

In the areas of building operations and energy conservation, we are establishing and monitoring projects including high efficiency burners, motion sensors for light switches, micro processor based thermostats, and direct digital computers for building mechanical systems.

We recently carried out an extensive study into the use of logs as a primary building material. Having followed up on that with the design and construction of log schools and community halls, we now want to follow up with an evaluation to see if our original assumptions were correct.

As you can see then, we in the Department are faced with the need and opportunity to develop solutions and designs to many unique conditions encountered in the Arctic. This process may not meet the strict terms of research, but it does produce a very large volume of information in Arctic engineering.

I would now like to suggest some ways in which we might cooperate in addressing these problems.

Firstly, within our construction program there is some room for experimentation and the application of new technologies. Since we are building projects across the Arctic, and so already incurring a great expense, we should be cooperating together in the development of new technologies. We have projects, such as water and sewer installations in Frobisher Bay and Resolute Bay which have thermal probes installed to monitor the effect of these pipes on the permafrost. However, due to limited personnel resources and other priorities, we have not been able to establish a monitoring program. Through cooperation with universities and other research agencies, I would hope that opportunities such as these do not continue to be lost to us.

Secondly, planning and design of interior spaces continues to challenge us. Buildings are required for a wider range of indoor activities over a greater portion of the year than in the southern environment. Our displays at the ACUNS meetings in Yellowknife were ones that we put together for the Winter Cities Symposium held in Edmonton. You can see that how we carry out our work very much impacts on the quality of life in the Arctic. This is an opportunity then, for social scientists as well as planners and architects, to cooperate to define a built-environment suited to the needs of northern indigenous people.

Project evaluation is another area of our work where we would like to see a lot more activity. Because of our lack of resources, we are not able to go back to most of our projects to assess our assumptions and design decisions. I mentioned to you that we carried out a study of logs as a primary building material. Now that we have built some schools of log, we would like to go back to evaluate their performance against our objectives both sociological and technical. I believe the original study and design would be of interest to people engaged in such research and the opportunity to evaluate the buildings would be a particularly valuable one.

I would suggest that perhaps we could establish a process of exchanges of lecturers. Many of our people would be pleased to speak to your students about the work that they are doing. Since they travel frequently through the south, we could arrange to have them stop at schools and universities at little or no cost to you. In return, perhaps your people, when travelling to the north could stop to speak to our people.

We are now developing a list of information and research needs, which I would like to send to you if any of you would like a copy. In this way, I would hope that we can cooperate together to establish research projects that will be mutually benefiting to both of us.

I will end here by congratulating ACUNS for its decision to hold its annual meeting in the North. It has been an exciting experience for me. I would like to thank ACUNS and in particular Peter Adams, for allowing me this opportunity to develop this paper.

Note

The university profiles and information resource papers in this volume are a tiny step towards addressing Bob Doherty's concerns about the flow of northern information. ACUNS will also try to publish information about research opportunities such as those outlined here. The following are sources for those who would like to follow up points in this paper. A list of "useful" research topics, provided by Public Works and Highways, has been widely circulated by ACUNS. Additional copies are available (ed).

Cold Climate Utilities Manual (D.W. Smith, ed). Canadian Society of Civil Engineers, 2050 Mansfield Street, Montreal, Quebec H3A 1Z2.

Northern Perspective — A Livable Winter Environment (a pamphlet, 15 p., prepared by Public Works and Highways, GNWT, for the Winter Cities Conference, 1985).

THE NORTHERN SCIENTIFIC TRAINING PROGRAM: A PROGRAM TO SUPPORT UNIVERSITY DEVELOPMENT OF SCIENTIFIC EXPERTISE IN CANADA'S NORTH

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Introduction

Because of the Minister's statutory responsibility for fostering science and technology in the Canadian North, including support to stimulate university development of scientific expertise in the North, the Department of Indian Affairs manages the Northern Scientific Training program (NSTP). Furthermore, while this paper will focus on the NST Program, it should be noted that in support of the training of northern scientists and the development of scientific knowledge about the Canadian North, the Department also administers core funding to the Association of Canadian Universities for Northern Studies and maintains liaison with the Association. Our liaison function with the Association and its university membership is focussed in areas relating to the advancement of northern scholarship in terms of education, professional and scientific training, and research.

This paper provides an overview of the Program and its activities, as well as the range of training support for northern studies within Canadian universities. This support to university development of scientific expertise in Canada's North, combined with our program to establish and operate northern scientific resource centres providing ready access to scientific equipment and logistical support, represent two unique approaches to meeting this Department's responsibility for fostering science and technology in the North.

I Origin of the Program

The Northern Scientific Training Program originated in 1961 when the Scientific Research Committee of the Advisory Committee on Northern Development (A.C.N.D.) reviewed the scope and trend of Canadian research in the North. The Committee concluded that the northern research then planned was almost exclusively undertaken by government agencies. Few universities were active in northern work, and Canadian students had little opportunity to conduct northern research, other than as assistants on government surveys. With limited research funds, universities could not afford to carry out studies in the North, for such studies were always more expensive than comparable studies in southern Canada. In consequence, it was becoming increasingly difficult to attract sufficient numbers of experienced northern scientists and other specialists with adequate northern training and experience to government service, and to find teaching staff with northern interests for faculty positions at Canadian universities.

Recognizing that Canadian universities were not producing northern specialists in sufficient numbers to meet national needs, and that interest in scientific research in the North was decreasing because of inadequate financial support, the Northern Scientific Training Program was initiated to help redress the situation.

After two decades of operation, the Program's general aims remain virtually unchanged. However, the Training Program has expanded and adapted its efforts to continue playing a unique role in providing special support needed to help universities ensure that interested students have opportunities to obtain the specialized skills and training required for professional work in the North. In view of the increasing number of requests for funding, the Program has become an assistance program providing supplementary funding to offset the additional costs of Northern fieldwork.

It is interesting to note that from its modest beginning in 1962, entailing $21,000 in allocations to 6 universities, the Program budget for 1985-86 was $825,000 in support of 27 university applications. Furthermore, in reference to Table 1, The Distribution of Allocations under the Northern Scientific Training Program by University, 1962-63 to 1984-85, to date the Program's contribution to university training in northern studies has totalled $7,045,840.

II Program description and administration

The following outlines the purpose and objective of the Program, along with details regarding the nature and scope of funding, fields of research supported, application procedures and criteria for assessment; and its administrative structure and functions.

Purpose of the Program

To support Canadian universities in providing training that gives advanced students professional experience in the Canadian North and encourages them to develop a commitment to northern work.

Program objective

To increase the number of graduate and other advanced students in Canadian universities who have specialized in some aspect of northern studies, and who have northern research experience.

Methods

A. By encouraging the formation of multi-disciplinary focal points for northern studies within Canadian universities, thus stimulating student interests in the Canadian North;

B. By providing supplementary financial assistance to universities for students, to help students offset the cost of specialized studies in the North.

Purpose of the funding

The primary purpose of the Northern Scientific Training Program is to help advanced students carry out research in the North. The term "research" is taken to include all forms of scholarly and professional inquiry and related training activities. The term "North" is normally understood for purposes of the Program to include that part of Canada which lies north of the southern limit of the discontinuous permafrost zone, with the addition of all of the southern Yukon in the West, and that section of Labrador up to and including Happy Valley and Hamilton Inlet in the East. This definition also includes all air and marine areas contained within those limits.

Eligibility for funding

Applications for Training funds must be made by the Director or Chairman of an officially recognized Institute or Committee for Northern Studies at a Canadian University (i.e., recognized by the President of the University). Applications from individuals are not accepted.

Applications must be for support of advanced students (i.e., 3rd and 4th year undergraduate, or graduate level); post-doctoral studies are not supported. Students supported by Training funds must be Canadian citizens or permanent residents and it is the university's responsibility to ensure that students meet this criterion of eligibility. Candidates must be enrolled in a degree program at the university from which they receive assistance unless they are enrolled at a Canadian university which does not have a recognized Committee or Institute for Northern Studies in which case they can apply through a participating university.

Uses of training funds

Training funds are offered in support of specific projects as outlined in applications, not as a general subsidy for the overall administrative, research or teaching program of a Northern Studies Institute, Program or Centre, and not as a subsidy for university faculty members.

Training funds are intended to assist in defraying the actual costs attributable to a northern research project which involves supervised field experience in the Canadian North. No provision is made for administrative overhead costs, for research carried on outside the Canadian North or archival research, data collection or laboratory analysis in southern Canada. It may not be used either to sponsor lecture series, publications, conference participation or other non-research activities. Training funds are not intended for use as support for undergraduate field courses, although part of a university's allocation can be used to support promising undergraduates at advanced levels (3rd and 4th year) who are involved in northern research projects.

The Northern Scientific Training Program is not intended as a source of primary support for students, but as a supplement to offset the additional costs of northern work. It is an assistance program, and because of its limited funds it cannot provide employment for students or on-going support in the form of general scholarships. The type of expenses covered for the 1985/1986 Program will be transportation costs, students' living expenses up to a per diem of $30 for the time spent in the field, as well as costs related to the hiring of translators and interpreters.

Fields of research supported

It is current policy of the Training Program Committee to encourage universities to undertake northern research in a wide variety of disciplines, and to undertake multidisciplinary projects where appropriate. The following list includes some of the main fields of research which have been supported to date:

Anthropology
Biology

Geography
Geology

TABLE I

DISTRIBUTION OF ALLOCATIONS UNDER THE NORTHERN SCIENTIFIC TRAINING PROGRAM BY UNIVERSITY, 1962-63 to 1984-85

UNIVERSITY	1962-63	1963-64	1964-65	1965-66	1966-67	1967-68	1968-69	1969-70	1970-71	1971-72	1972-73	1973-74	1974-75	1975-76	1976-77	1977-78	1978-79	1979-80	1980-81	1981-82	1982-83	1983-84	1984-85	TOTAL
University of Alberta	4,800	4,800	5,000	6,500	7,000	11,000	13,000	14,000	10,000	20,000	22,500	25,000	30,000	35,000	36,000	37,000	38,000	35,000	33,000	36,000	37,000	43,000	51,000	554,600
Bishop's University							1,000	1,340				2,500												4,840
University of British Columbia	1,500	4,000	12,000	15,000	22,500	27,000	27,500	27,500	22,000	30,000	32,500	35,000	37,000	32,000	33,000	34,000	33,000	28,000	26,000	29,000	29,000	29,000	25,000	591,500
University of Calgary																		5,000	10,000	16,000	21,000	28,000	30,000	110,000
Carleton University																	8,000	10,000	15,000	20,000	24,500	32,000	43,000	152,500
University of Guelph																						15,000	19,000	34,000
Lakehead University					3,000	4,000	3,500	4,000	2,000															16,500
Université Laval	6,000	7,000	13,000	20,000	25,000	27,000	27,500	27,500	22,000	30,000	32,500	35,000	37,000	38,500	39,500	40,000	37,000	32,000	38,000	44,500	50,500	57,000	57,000	743,500
University of Manitoba	1,500	1,500	5,000	8,000	16,000	20,000	22,500	23,000	21,000	27,500	32,500	35,000	37,000	38,500	39,500	40,000	35,000	31,000	31,000	36,000	41,500	41,500	48,000	632,500
McGill University			5,000	5,000	10,000	11,000	10,000	10,000	10,000	17,500	17,500	22,500	27,500	30,000	31,000	35,000	35,000	35,000	37,500	41,000	46,500	50,500	58,000	545,500
McMaster University												10,000	12,000	14,000	15,000	15,000	15,000	17,000	20,000	26,000	30,500	30,500	37,000	242,000
Memorial University		5,000	5,000	10,000	12,500	17,000	17,000	17,000	13,000	15,000	17,500	17,500	15,000	17,500	17,500	25,000	26,000	26,000	30,000	30,000	28,000	34,000	36,000	431,500
Université de Montréal				3,000	10,000	10,000	8,000	9,500	8,000	10,000	10,000	10,000	8,000	12,000	12,500	13,000	13,000	10,000	15,000	13,000	21,500	21,500	28,000	246,000
University of New Brunswick																						10,000	12,500	22,500
University of Ottawa										10,000	10,000	11,500	12,500	13,000	14,000	15,000	15,000	15,000	21,000	22,500	27,000	29,000	37,000	252,500
École Polytechnique													10,000	10,000	10,500	12,000	15,000	18,000	26,000	28,500	30,000	28,000		188,000
Université du Québec à Chicoutimi											6,000	10,000	15,000	17,000	18,000	20,000	22,000	25,000	23,000	21,000	28,000	23,700		228,700
Université du Québec à Trois-Rivières																				10,500	16,000	19,000	22,000	67,500
Queen's University																7,000	7,000	5,000		11,000	18,000	22,000	36,000	106,000
University of Regina																							6,000	6,000
Ryerson Polytechnical Institute																						5,000	20,000	25,000
University of Saskatchewan	6,000	7,000	12,000	15,000	24,000	27,000	30,000	27,000	30,000	30,000	32,500	35,000	37,000	38,500	39,500	40,000	38,000	36,000	32,500	40,000	39,000	40,000	43,000	699,000
Simon Fraser University																						2,300	11,000	13,300
St. Paul University	1,200	1,200	5,000	5,000	6,500	8,000	9,000	9,500	7,000															52,400
University of Toronto						19,500	19,500	19,000	10,000	17,500	20,000	20,000	20,000	17,000	17,000	18,000	22,000	25,000	22,000	28,000	36,000	46,000	55,000	431,500
Trent University																		8,000	5,000	8,000	13,000	13,000	16,500	63,500
University of Waterloo																	6,000	8,000	8,000	16,000	21,000	23,000	30,000	112,000
University of Western Ontario											6,500	10,000	12,000	12,000	13,000	14,000	13,000	11,000	11,000	16,000	22,000	24,000	28,000	192,500
University of Windsor																		8,000	12,000	16,000	23,000	24,000	32,000	115,000
York University															7,500	9,000	12,000	12,000	9,000	16,000	22,000	34,000	44,000	165,500
TOTAL	21,000	30,500	62,000	87,500	136,500	181,500	188,500	189,340	155,000	207,500	240,000	279,000	310,000	325,000	343,500	374,000	390,000	400,000	425,000	525,000	625,000	725,000	825,000	7,045,840

Botany
Earth Sciences
Engineering
Environmental Sciences
Resource Management
Political Science
Zoology

The above is not an exclusive list. The Training Program is open to supporting research in any field of inquiry in the social, physical, medical, applied or administrative sciences, as long as the research has an essential orientation to the Canadian North.

It is expected that the Ethical Principles for the Conduct of Research in the North, developed by the Association of Canadian Universities for Northern Studies, will be followed by all projects funded under the Training Program. In addition, all other ethical and research guidelines in specific disciplines apply to any projects in those disciplines which are conducted with NSTP support. Finally, university groups receiving assistance from the NSTP are responsible for ensuring that students acquire all necessary permits and licenses.

Application procedures

Each year, in September, Program Guidelines and application forms are distributed to those universities which have participated in the Training Program in previous years, and/or have recognized institutes, committees or programs of northern studies. Guidelines and forms are mailed in early fall. Each university wishing to make an application for Training funds must do so by completing and mailing the application form by December 15. Funding decisions are made by February 15 and communicated immediately to the universities by telex and letter. Payment is made in block funds to the universities at the beginning of the federal government's fiscal year in early April.

It should be noted that Program allocation in the form of block funding is particularly welcomed by universities because it promotes cooperation at the university level, avoids pressure on the direction or topic of research, and permits great flexibility in adjusting the funds to changing needs and circumstances of individual universities.

Assessment of applications

Allocation of the Training funds is made on the basis of assessments of each application according to the following general criteria:

1. completeness and clarity of the information included in the application;
2. number of students supported by Training funds in the previous year, and proposed for the upcoming year;
3. extent to which the application fits within Program guidelines; and
4. evaluation of past performance and up-coming plans.

Program administration

The Training Program is managed by the Department of Indian Affairs and Northern Development. An interdepartmental Committee is responsible for ensuring the effective use of funds provided by the Program to universities. The participating universities are responsible for using the funds to assist promising students in gaining supervised northern experience and training.

The Training Program Committee makes major Program policy, as well as all funding decisions. The members are appointed by the Minister of Indian Affairs and Northern Development. Participating universities are invited to help set direction for the Program at a meeting held at the Annual Conference of the Association of Canadian Universities for Northern Studies (ACUNS) each year, during visits to individual universities by Program management, and on other occasions.

In addition to ongoing administrative tasks including annual refinements to Program guidelines and applications, activities undertaken by Program management entail the following: preparation of Annual Reports, bibliographies on NST Program supported activities, and publicity initiatives within universities to encourage the formation of multi-disciplinary focal points for northern studies within Canadian universities, as well as to ensure that students from all departments have equal access to the NST Program.

III Overview of Program support to universities for northern studies

Regarding an overview of Program support to universities for northern studies, the following provides a statistical summary of NST Program support to universities during 1985, and a review of the relevant Program impact on stimulating university development of scientific expertise in the north.

A. Summary of NSTP support to universities

In reference to Table 2, Overview of Northern Scientific Training Support to Universities, 1985, sub-table 2:1, the distribution of NSTP funds by number of students supported, allocations per student, number of days per student in the north, and cost per student/day in the north, reveals the following. Specifically, 348 students were supported receiving an average of $2,408.85, with students spending an average of 51.3 days in the North at an average cost of $46.95 per student/day in the North.

Regarding the distribution of Northern Scientific Training funds by type of support, sub-table 2:2 indicates student transportation predominated expenditures allocated, followed by those for student living expenses, freight, and translators/interpreters.

The information contained in sub-table 2:3, entailing the distribution of Training funds by scientific field, reveals that the human science focus has increased from the previous year i.e., 26.3% to 28.5%. However, projects in the life and physical sciences still predominated the distribution, together representing 69.8% of the total. The distribution of students supported by the NSTP by scientific field, found in sub-table 2:4, is analogous to the previous finding in that students in the life and physical sciences predominated, together comprising 243 or 69.7% of the total, followed by 99 (28.4%) and 6 (1.7%) in the human sciences and other, respectively.

With respect to the distribution of Northern Scientific Training funds by geographic focus, sub-table 2:5

TABLE 2

OVERVIEW OF NORTHERN SCIENTIFIC TRAINING SUPPORT TO UNIVERSITIES, 1985

2:1
DISTRIBUTION OF NORTHERN SCIENTIFIC TRAINING FUNDS BY NUMBER OF STUDENTS SUPPORTED, ALLOCATIONS PER STUDENT, NUMBER OF DAYS PER STUDENT IN THE NORTH, AND COST PER STUDENT/DAY IN THE NORTH

	Total Funds Allocated	Total Funds Sent/Committed	Total Number of Students Supported	Average Funds Allocated per Student	Average Number of Days per Student in the North	Average Cost per Student/Day in the North
TOTAL	$825,000	838,283.01	348	2,408.85	51.3	46.95

2:2
DISTRIBUTION OF NORTHERN SCIENTIFIC TRAINING FUNDS BY TYPE OF SUPPORT

	TYPE OF SUPPORT				
	Student Transportation	Student Living Expenses	Freight	Translator/Interpreter	TOTAL FUNDS SPENT
TOTAL	$ 431,928.33	323,898.16	64,299.07	18,157.45	838,283.01
%	51.5	38.6	7.6	2.1	

2:3
DISTRIBUTION OF NORTHERN SCIENTIFIC TRAINING FUNDS BY SCIENTIFIC FIELD

	SCIENTIFIC FIELD				
	Physical Sciences	Life Sciences	Human Sciences	Other	TOTAL FUNDS SPENT
TOTAL	$ 267,103.33	319,228.68	239,371.00	12,580.40	838,283.01
%	31.8	38.0	28.5	1.5	

2:4
DISTRIBUTION OF STUDENTS SUPPORTED BY NORTHERN SCIENTIFIC TRAINING PROGRAM BY SCIENTIFIC FIELD

SCIENTIFIC FIELD					
	Physical Sciences	Life Sciences	Human Sciences	Other	TOTAL NUMBER OF STUDENTS
TOTAL N	108	135	99	6	348
%	31.0	38.7	28.4	1.7	

2:5
DISTRIBUTION OF NORTHERN SCIENTIFIC TRAINING FUNDS BY GEOGRAPHIC FOCUS

	GEOGRAPHIC FOCUS					
	Northwest Territories	Yukon	Labrador	Northern Québec	Other	TOTAL FUNDS SPENT
TOTAL	$ 371,708.16	131,247.48	35,709.48	154,571.76	145,046.61	838,283.01
%	44.3	15.6	4.2	18.4	17.3	

2:6
DISTRIBUTION OF STUDENTS SUPPORTED BY NORTHERN SCIENTIFIC TRAINING FUNDS BY ACACEMIC LEVEL

	ACADEMIC LEVEL OF STUDENTS			
	Undergraduate	Graduate		TOTAL
		Master's	Doctoral	
TOTAL N	143	145	60	348
%	41.0	41.6	17.2	

TABLE 3
PERCENT CHANGE OF ALLOCATIONS UNDER THE NORTHERN SCIENTIFIC TRAINING PROGRAM AND NUMBER OF STUDENTS SUPPORTED, 1980-81 to 1985-86

		ALLOCATIONS			STUDENTS SUPPORTED		
YEAR	Total Number of Universities	Total	Percent Change Over 1980-81	Annual Percent Change	Total	Percent Change Over 1980-81	Annual Percent Change
1980-81	20	425,000	100.0		204	100.0	
1981-82	22	525,000	+23.5	+23.5	234	+14.7	+14.7
1982-83	22	625,000	+47.1	+19.0	285	+39.7	+21.8
1983-84	26	725,000	+70.6	+16.0	317	+55.4	+11.2
1984-85	26	825,000	+94.1	+13.8	295	+44.6	-6.9
1985-86	27	825,000	+94.1	0.0	348	+70.6	+18.0

revealed that 59.9% of the projects were undertaken in the NWT and Yukon, with the distribution dominated by studies in the NWT, followed by those conducted in Northern Québec, other i.e. northern provinces, Yukon and Labrador.

Finally, sub-table 2:6, the distribution of students supported by the NSTP by academic level, reveals that the majority of students were in a master's program, comprising 41.6%, closely followed by those at the undergraduate, and then doctoral level, entailing 41.0% and 17.2% respectively.

B. Program impact on university development of northern scientific expertise

In regard to an assessment of the relevant impact of the Program on stimulating university development of northern scientific expertise, past Program reviews/evaluations reveal the following. First, the Program has been successful in training graduate scientists with northern experience and a commitment to northern work. Specifically, a recent evaluation found that training funds contributed significantly to helping students obtain northern experience who otherwise might not have been able to do so; and whose commitment to northern work was reinforced by the type of field experience encouraged by the program.

Furthermore, with respect to encouraging the development of increased focal points for northern studies within Canadian universities, the same evaluators found that the Program did indeed encourage the development of such foci. In addition, NSTP activities comprised an important vehicle for getting faculty and students together from various disciplines with a common interest in the North. It is interesting to note that despite the annual rate of inflation and its bearing on the rising costs of operationalizing training projects in northern scientific research, Table 3, Percent Change of Allocations under the Northern Scientific Training Program and Number of Students Supported, 1980-81 to 1985-86, reveals that the number of participating universities and students supported continues to increase.

The Program has also had an impact on several other, yet related areas. First, the Program has been successful in encouraging the focus of university northern studies on the full range of disciplines or scientific fields. In this regard, Table 4, Distribution of Students Supported by Northern Scientific Training Program by Scientific Field, 1980-81 to 1985-86, demonstrates the scientific range in university northern studies, which, although predominated by life sciences, includes balanced representation from the physical and human sciences. Secondly, the Program has stimulated financial support for northern research at a number of universities by other agencies, including provincial governments, private foundations, industry and universities themselves. Finally, the Program's relationships with universities have led to a better understanding in universities of the government's and the Department's northern activities and problems, and possibly to a better understanding within the government and the Department of the contribution that universities can make to northern development.

Conclusion

Presently, the environment in which the NST Program functions is undergoing a rapid change. For example, the Program is influenced by such factors as current govern-

TABLE 4
DISTRIBUTION OF STUDENTS SUPPORTED BY NORTHERN SCIENTIFIC TRAINING PROGRAM BY SCIENTIFIC FIELD 1980-81 to 1985-86

	SCIENTIFIC FIELD								
	Physical Sciences		Life Sciences		Human Sciences		Other		
YEAR	N	%	N	%	N	%	N	%	TOTAL NUMBER OF STUDENTS
1980-81	40	19.6	79	38.7	54	26.5	31	15.2	204
1981-82	71	30.3	78	33.3	64	27.4	21	9.0	234
1982-83	89	31.2	104	36.5	78	27.4	14	4.9	285
1983-84	94	29.6	119	37.5	97	30.6	7	2.2	317
1984-85	87	29.5	123	41.7	83	28.1	2	0.7	295
1985-86	108	31.0	135	38.7	99	28.4	6	1.7	348

ment policy of fiscal restraint, declining university enrollments and employment opportunities for graduates, increasing need for scientists with the training, sensitivity and experience required for positive northern work, the need to work constructively with northerners in planning and conducting research, along with meeting the increased costs and demands entailed in operationalizing training projects in northern scientific research.

Nevertheless, the Program remains successful in stimulating university development of northern scientific expertise through its support to Canadian universities in providing training that gives students professional experience in the Canadian North, and encourages them to develop a commitment to northern work. On this point, I will conclude my presentation by quoting from a recent evaluation of the program. Specifically,

> "it is the only program which offers support for northern research to undergraduate and graduate students in all fields, specifically for the purposes of on-site research training. It offers support not only to supplement students in areas that might be supported by other programs, but also in areas, such as applied interdisciplinary research in environmental assessments, for which less support is available elsewhere. It is unique both in its emphasis of training over the production of specific research results, and in its encouragement of universities to develop a focus on northern studies rather than just to carry out northern research projects". (Kubiski and Associates Ltd., 1982, *The Northern Scientific Training Grants Program: An Evaluation and Developmental Study*. Toronto: W.S. Kubiski and Associates Ltd. p. 32).

AN INTRODUCTION TO THE SCIENCE INSTITUTE OF THE NORTHWEST TERRITORIES

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The Science Institute of the Northwest Territories exists in part because of the immutable law of human behavior — "legislation abhors a vacuum". Since, until recently, little or no science originated in the Northwest Territories, the Territorial Legislature attempted to remedy this situation by the passage of the Science Advisory Board Act in 1975.

This may be regarded as an interim measure, but was decidedly better than none. The Act set up a thirteen man Board whose principal duty was to advise the Territorial Legislature on matters of science and technology. The Board had a busy and fairly happy existence until 1985/86, mainly because the Chairman of the day, Dr. Omond Solandt, took it upon himself to see that the Board offered advice to the Legislature whether it was called upon to do so or not. Nevertheless, the Board was seen, and quite rightly so, as an instrument of the government and could not by any stretch of the imagination be called a free-standing scientific body.

In 1978, the then Minister of Indian and Northern Affairs, Mr. Hugh Faulkner, directed Keith Greenaway and Donat Savoie, of his department, to investigate how scientific activities could be made more relevant to northern needs and concerns. After extensive consultation, Greenaway and Savoie prepared a report containing a number of recommendations. A meeting was then organized in Ottawa in 1979, and was attended by every government department with an interest in northern science, as well as numerous other people knowledgeable in northern scientific matters. With the report and resulting terms of reference from the 1979 meeting in hand, the Science Advisory Board assumed the initiative, supported by Indian and Northern Affairs. The result was the passage of the Science Institute of the Northwest Territories Act in 1984, which was subsequently amended in 1985. The Institute's Board of Governors met for the first time in August of that year.

This Act established the Science Institute as a free-standing entity at arms-length from the Territorial government. The Government of the N.W.T. has undertaken to provide core funding and certain other valuable considerations such as office space, but the Institute's only connection with the government itself is by three links: 1) It is duty bound to report annually through the designated Minister to the Legislative Assembly of the N.W.T., 2) Its members are appointed by the Executive Council of the Government of the Northwest Territories, 3) it must by law, answer questions in the fields of science and technology put to it by the Legislature. Other than these responsibilities, the Institute has almost unlimited freedom to pursue the development of science in the N.W.T. as it sees fit.

This is easier said than done, however, and to achieve this the Institute must overcome a deeply ingrained and firmly entrenched pattern of thought on the part of the science community of Canada. I think it is widely agreed that science in the modern sense began in Canada at the end of the Napoleonic Wars when the British found themselves with a surplus of ships and officers who were anxious to pursue scientific investigations throughout the world. A very great deal of this attention was focused on the arctic regions, principally of course, to open the Northwest Passage.

This imperialistic attitude toward the north has continued to the present time, due in large part to its persistence within Canadian society as a whole. The lack of any local capability to undertake worthwhile science in the north has contributed to the situation. Yet, the southern Canadian scientific community can hardly be blamed for filling what was clearly a vacuum. Slowly, but surely, this is changing and the ability of the northern population to undertake science on its own is gradually emerging. The Science Institute plans to act as a stimulus and hopefully around it will slowly coalesce a resident scientific community, which will undertake investigations on behalf of the legitimate interests of northerners.

Purpose and objectives

In short, the purpose of the Science Institute is to foster science in the Northwest Territories, increase public awareness of scientific activities and ensure northern participation in scientific and technological research, programs and activities. This rather broad statement of purpose translates into five major objectives, which are as follows:

1) To foster a resident scientific community within the N.W.T., which recognizes and uses relevant traditional knowledge of the aboriginal peoples.
2) To extract and disseminate scientific knowledge of northern relevance from ongoing research in the N.W.T. and elsewhere.
3) To identify and conduct research which will contribute to the social and economic prosperity of the people of the Northwest Territories.
4) To license, coordinate and facilitate research being conducted in the N.W.T. by Canadian and foreign scientists.
5) To provide sound and humane advice on scientific matters to the Minister, the Government of the N.W.T. and the general public.

There are several key characteristics of the Science Institute that we see as essential in fulfilling our purpose. The Institute must perform, and be seen to be performing, the role of an impartial, trusted advisor. It is important that this view of the Institute be universally shared, and such an image cannot be achieved by fiat. It must be earned. In addition, the Science Institute will strive to adopt the perspective of an informed generalist in the interpretation of science to the northern public. It must attempt to demystify science. The Institute also recognizes the legitimacy of aboriginal or traditional knowledge (that knowledge possessed by the aboriginal cultures of the N.W.T.) and must ensure that the scientific establishment takes full advantage of this knowledge where this is appropriate. The Science Institute is in a position to bridge the gap between indigenous knowledge and mainstream scientific activities. Finally, we recognize the necessity of both pure and applied science.

Current activities and plans

Although the Institute is brand new in an organizational sense, there are already a number of programs and activities in place which I will briefly describe:

1) Licensing scientific research, excluding archaeology and wildlife, under the N.W.T. Scientists Act.
2) Publishing — including both background studies and occasional papers. The Institute's first background study is entitled *The Investigation of the Viability of a Remote Wind/Hydro Electric Power Supply in the N.W.T.* and the first occasional paper is a summary of current science and technology activities by the Government of the Northwest Territories.
3) Training — the Institute supports up to 25 northern residents per year (students or otherwise) who wish to work on scientific field projects in the N.W.T. We have also assumed the coordinating and monitoring responsibilities necessary to establish the Eastern Arctic Seaboard Monitoring program (EASMP) on a firm footing. Eli Panipakoocho from Pond Inlet, one of the founders of this program, will be discussing their work at this meeting.
4) Research — This includes both research which the Science Institute initiates (such as a current survey of northern native research concerns) to questions which the Legislative Assembly assigns. As an example of the latter, the Institute has been asked to assess the economic and safety factors associated with the use of the SLOWPOKE nuclear reactor in the Northwest Territories.
5) Information Gathering — the Institute maintains current information on a variety of topics which are, or could become, particularly relevant to northern residents. These topics include agriculture, coal, climatic change, forestry, berylium and many others. This information is available to anyone who is interested.
6) Professional liaison — this involves keeping in touch with the dozens of agencies and organizations that are doing northern research or scientific policy work, both from within and outside the N.W.T. It also requires that we host or organize conferences and workshops of particular interest, such as the upcoming Energy Futures Conference, or assist with events such as the 1987 meeting of the Arctic Division of the American Association for the Advancement of Science, in Yellowknife. These activities all assist the Science Institute in becoming a focus for scientific affairs in the N.W.T.

The Science Institute is guided by a Board of Governors, consisting of seven northern residents and six southern professionals, including the Chairman, Dr. J.M. Harrison. The current Board draws together a variety of professions and perspectives, including traditional knowledge, anthropology, education, medicine, economic development, science administration, engineering and geomorphology. The Institute will soon be moving to a suite of new offices in the Scotia Tower in downtown Yellowknife. We had the privilege of being able to design these offices to suit our particular requirements, and have made provisions for four full-time staff, two offices for visiting scholars and a combination library and boardroom that can accommodate 20 people comfortably. With a modest, but secure, amount of core funding in place to ensure the daily operation of the Institute, we now have the responsibility to secure funding from a variety of other sources to support a number of new programs and activities.

Since joining the Institute in mid-March, 1986, I have been working to determine both Institute priorities and the activities necessary to address them. I am going to present numerous possibilities to the Board members for their review at our next meeting in June, and until that time it would be inappropriate for me to spell them out in detail. I can say, however, that I intend to place heavy emphasis on: 1) the fostering of a resident scientific community which recognizes traditional knowledge, 2) extracting and disseminating knowledge of northern relevance and 3) conducting research that will contribute to the social and economic prosperity of the Northwest Territories.

In the meantime, I would like to take advantage of this captive audience and ask all of you for whatever suggestions you might have on work that the Institute should consider. I am completely serious about this and invite you to write the Institute or telephone me collect. An awareness of your concerns is an important part of our planning for the future.

We have found that since we have been established, which is only a matter of months, our welcome into the scientific community in Canada has far exceeded our expectations. The need for an Institute such as ours in the N.W.T. is apparently so obvious that it has met with universal approval. And in that respect, I would hasten to assure you that nothing which I have said should be taken as parochial in any sense. Once we are fully under way, we will make every effort to facilitate science in the north by university-based scientists and researchers from all disciplines. Our aim is not only to carry out and support research where we identify the necessity, but also to honour our commitment to the young people of the N.W.T. through the encouragement of science as a career.

The future

There are many uncertainties in the Institute's future, however, and prominent among them is the possible formation of a national polar institute, as announced by the Minister of Indian and Northern Affairs last fall. I do know that we can count on Dr. Roots, and his committee to assess the feasibility of such an institute, to help us to fulfil our ambitions in the Northwest Territories. Certainly no one has so far suggested that a national polar institute should supplant us. In a recent brief to Dr. Roots, I outlined a number of considerations which our Board felt were of fundamental importance in any attempt to create such an institute. I want to conclude my paper this afternoon by reiterating several of them, as they are equally relevant to the conduct of research and higher education in the N.W.T.

1) *The need for coordination and cooperation* — There are currently dozens of organizations and institutes with northern responsibilities (both government and non-government, and resident and non-resident), not to mention the many universities with northern research interests and programs. Generally speaking, the cooperation and collaboration to date among these organizations have been minimal. What has occurred has been largely a result of individual personalities, not organizational commitment. Clearly, the fostering of constructive working relationships among these diverse agencies must be a high priority, if for no other reason than individual organizations are finding it increasingly difficult to operate in isolation for a variety of financial, political and cultural reasons. I propose that a meeting of northern institute directors and board chairmen be held sometime in the near future. This might be a useful forum for much-needed collaboration.
2) *The importance of the social sciences in the Canadian north* — Every consideration must be given to recognizing the importance of the social sciences, despite the apparent tendency to emphasize the physical and natural sciences, as well as engineering and technology. Although these latter disciplines are of particular importance in matters of economic development, the social sciences are essential to gaining a clearer understanding of our political and social goals in order to guide the forces of science and technology.
3) *The importance of political devolution in northern Canada* — The future will see an ever-increasing devolution of provincial-type responsibilities from the federal government to the Northwest Territories. All must recognize that the federal government's direct involvement in territorial affairs is being reduced in a gradual and orderly manner.
4) *The importance of decentralization in northern science policy and administration* — The key challenge is to lay the groundwork for an effective and practical network within the northern science community, by recognizing and nurturing those individuals and organizations who are already doing things well in their respective fields and/or jurisdictions. The principle should be that tasks be performed at the most local level and that they can be performed well. There must be an opening up of the system and an end to insularity, combined with judicious coordination and mutual support.
5) *The permanence of social change in northern Canada* — Social change, and its rapidity, are salient characteristics of contemporary life in northern Canada. The scientific community, be it southern or northern-based, must participate in this change, not just react to it or adapt to it.
6) *The importance of developing a circumpolar perspective* — Generally speaking, Canada's collaboration with other circumpolar nations on matters of mutual interest has been minimal. There is a wealth of both expertise and knowledge in all northern countries which could be of enormous benefit to residents, scientists and policy makers throughout the circumpolar world. All of us should play a role in increasing communication by adopting a more systematic and regularized approach to information sharing, scientific/scholarly exchanges, joint projects, internships and so forth. Such activities occur now with Canada's sponsorship, but they do so on a small scale with seemingly great difficulty.
7) *The need to balance sovereignty with stewardship* —There has been a lot of press lately concerning the need for Canada to reassert its claim over its north.

Thomas Berger, in an address to the Heritage North '85 Conference (Yellowknife: September, 1985), recognized the legitimacy of this claim, but also recognized the need for Canadians to assume the stewardship or care of the Canadian north. We must exercise this responsibility, by ensuring that political expediency is balanced with natural and cultural considerations of equal, or perhaps more enduring, significance.

8) And finally, the need to recognize the legitimacy of aboriginal knowledge. The nearly complete dominance of the western scientific perspective is a serious problem in the Northwest Territories. Overcoming this will require a new humility on the part of all those who do scientific work here.

In conclusion, I congratulate all the members of the Association of Canadian Universities for Northern Studies for your initiative in meeting in Yellowknife, and your increasing awareness of northern interests. This increased recognition of the importance of the social context in northern research is without a doubt one of the most important developments within the scientific community in the past ten years. We trust that this awareness will continue to grow. It must. Who knows, your efforts and ours, along with those of the Arctic College System and the peoples of the N.W.T., may eventually result in a new member for ACUNS — the University of the North.

Acknowledgements

I would like to thank Jim Harrison, Dan Billing and Caron Lorenzen for their assistance in the preparation of this paper.

APPENDIX

The following publications are available from the Science Institute of the Northwest Territories:

Contribution to the Northwest Territories Population Studies, 1961-1985 by Professor Louis-Edmond Hamelin, 54 pages

Aquatic Resources of the Northwest Territories by Dr. Peter J. McCart and Mr. J. Den Beste, 55 pages

The Present Status and Future Management of Arctic Marine Mammals in Canada by Drs. Rolph A. Davis, Kerwin J. Finley and W. John Richardson, 93 pages

Management of Some Terrestrial Mammals in the Northwest Territories for Sustained Yields by Dawn M. Dickinson and Tom Herman, 71 pages

Dietary Habits and Nutritional Base of Native Populations of the Northwest Territories by Otto Schaefer and Jean Steckle, 38 pages

Wind Energy in the Northwest Territories by B. Janz, D.G. Howell and A. Serna, 108 pages

Fish, Fur and Game in the Northwest Territories, 40 pages

Fish, Fur and Game for the Future: A summary of Presentations and Discussions, 28 pages

Metallic Contaminants of Significance to Northwest Territories Residents by R.D.P. Eaton, 35 pages

An Investigation of Possible Small Hydro Generating Sites in Northwest Territories Communities by Ferguson, Simek, Clark, 68 pages

An Acid Deposition Perspective for the Northwest Territories by S.R. Shewchuk, 32 pages

Order ($5.00 per copy) from:

The Science Institute of the N.W.T.
P.O Box 1617
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NOTICE OF A REPORT ON THE RESEARCH CONCERNS AND PRIORITIES OF NORTHWEST TERRITORIES NATIVE GROUPS

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A report is being prepared presenting the point of view concerning all aspects of research, of the Native groups of the Northwest Territories. This report will consist of separate individual reports from each participating group or organization, prepared on the basis of direct consultation with each group. Funded jointly by the Association of Canadian Universities for Northern Studies (ACUNS), and The Science Institute of the Northwest Territories, the project is meant to provide a forum for Native groups to state their priorities and recommendations for both the content and process of research, as well as to state whatever concerns and grievances they may have about the conduct of research. Project director is Lynda Lange, based at the Boreal Institute for Northern Studies, University of Alberta, Edmonton.

All groups have received an initial communication about this project, and a number have already been consulted with. Response has been very positive to the project, since many groups have a lot of concerns about the conduct of research.

It is hoped that the report will be useful to field researchers of all kinds, as well as funding agencies, whether research institutes, universities, government departments, industry, or other. Each report from an individual Native organization will contain a brief description of the organization, the process of consultation that was used to prepare the report, and a summary description of the results of consultation.

All Native groups, or organizations primarily run by Native persons in the N.W.T., are urged to participate in the project, so as to express the Native point of view concerning research as effectively as possible.

THE NATURAL SCIENCES AND ENGINEERING RESEARCH COUNCIL OF CANADA (NSERC)

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General

NSERC is a federal government funding agency whose mandate is to "promote and assist research in the natural sciences and engineering (other than the health sciences)". In 1985-86, NSERC's budget (exclusive of administration) was $299 M.

NSERC fulfils its mandate primarily by a series of programs that are in support of university-based research; the University-Industry programs, however, include a spectrum of activities ranging from university-based to industry-based research. The programs broadly consist of research grants (and other research support such as equipment and infrastructure grants) to university faculty, postdoctoral research fellowships, scholarships for graduate studies and Student Assistantship awards at the undergraduate level. In addition, general research support is provided in the form of block research grants to university presidents, scientific publication grants in support of Canadian scientific research publications, conference grants in support of workshops, symposia and meetings (held in Canada), and international scientific exchange awards.

It should be noted that in addition to the programs of "direct" NSERC scholarships and fellowships for postgraduate and postdoctoral studies, NSERC supports as many students and fellows again by "indirect" means — university faculty can use part of their research grant funds to pay stipends to the graduate students and postdoctoral fellows that they supervise.

Support for northern research

NSERC has one program dedicated exclusively to northern research — *Northern Supplements* (to research grants) — but northern research is supported generally, under most of the programs of grants and scholarships. This fact is illustrated in the remainder of this note. NSERC supports research projects at scores of locations throughout the two Territories and the provincial Norths.

Research grants

Operating grants

This is NSERC's largest research grant program, supplying the base support for the research projects of university faculty. The funds can be used to pay for materials and scientific equipment, to employ assistants, pay stipends to graduate students and postdoctoral fellows, and to pay for a range of services essential for running a research project.

In 1985-86 approximately 110 researchers were awarded grants (total funds approximately $2.7M) for on-going research with a northern component. Examples of such research topics are:

- deposition and use of fat in polar bears and black bears; and
- glaciology: field study, theory and instrumentation

In both cases graduate students were also working on the project, and were receiving financial support from the grants.

Northern Supplements

These grants are supplements to operating grants to help defray the *extra* costs of carrying out field work in the Canadian North. Such costs include travel to and within the North, safety expenses and the differential in costs of food and accommodation, for the faculty member, graduate students and assistants.

Last year 63 grants were awarded for a total of $330,000.

Strategic grants

Strategic grants are targeted grants, where the funds are awarded for research projects that are focussed on problems of national concern. Seven areas have been designated as Strategic areas: Biotechnology, Communications and Computers, Energy, Environmental Toxicology, Food/Agriculture, Industrial Materials and Processes, and Oceans. In addition there is an "open" category. Although northern research is not a Strategic area *per se*, most of the designated areas could have a northern component, apart from the "open" area. In 1985-86, 17 grants were in fact awarded for projects of relevance to the north; 7 were in Oceans, 2 in Energy, 2 in "Open" and one each in Biotechnology and Industrial Materials and Processes. The "Oceans" grants were concerned with sea ice and offshore structures; the other projects dealt with Arctic heatflow, oil pipelines, oil spills and fire management in the northern boreal forest.

As with operating grants, the Strategic Grant funds can be used for support of graduate students and postdoctoral fellows.

Infrastructure grants

Infrastructure grants are for the support of specialized research facilities and resources. Field stations belonging to, or affiliated with universities, are eligible for support under this program for the maintenance component of their running costs ("recoverable" costs are ineligible).

In 1985-86, five northern stations were awarded grants totalling $181,000: Kluane (Yukon, University of Calgary), Queen's Tundra Biology Station (La Pérouse Bay, Manitoba), McGill Subarctic Research Station (Schefferville, Quebec), Stations de terrain du Centre d'études nordiques (Université Laval, Kuujjuaq and Kuujjuarapik, in Northern Quebec).

Scholarships and Fellowships

NSERC's research manpower program extends to all stages of academic training from the undergraduate level to that of assistant professor. A selection of the award types is listed here.

Undergraduate level: NSERC Undergraduate Student Research Awards (USRA). These awards are for undergraduate students to gain research experience by working for a four-month period in a *university* or an *industrial* laboratory. In 1985-86, the numbers of awards held were:

University-based = 1974
Industry-based = 525

Under the university-based USRA program many students have been given the opportunity to undertake *field work in the Canadian North*. The USRA program and the Northern Scientific Training Program (NSTP) of the Department of Indian and Northern Affairs are complementary in that the NSERC program provides the stipend to the student while the NSTP program assists with travel costs to and from the North, and with travel costs and per diem allowances during the stay.

There are possibilities that Industry-based USRAs could be held with mining companies, etc. at locations in the North. Perhaps this avenue should be explored further?

Graduate level: There are 4 programs: Postgraduate Scholarships, 1967 Science and Engineering Scholarships Postgraduate Scholarships in Science Librarianship and Documentation, and Industrial Postgraduate Scholarships. In 1985-86 the numbers of awards held in each category were:

PGS = 2433
1967 Science and Engineering = 162
Library Science = 13

As with the USRA awards, many holders of NSERC postgraduate awards have pursued their studies through *Field work in the North*. Travel funds and per diem costs for the students were usually supported either from NSERC research grants to their supervisors, or by NSTP grants.

Postdoctoral level: Awards at this level are in the categories of Postdoctoral Fellowships (NSERC NATO) and Research Fellowships (University and Industry). The numbers of these fellowships held in 1985-86 were:

NSERC Postdoctoral Fellowship = 204
University Research Fellowship = 314

We have no information on how many Postdoctoral fellowships are supporting research projects carried out in the North.

The University Research Fellowships come with a research grant: in 1985-86, six of these research grants were awarded to Fellows whose projects included field work in the North. Four of these projects were on ecological and population studies, one on metal tolerance of mosses and macrophytes and the other on fossil plants.

Other grants which support northern research

Publication grants: assist in the publication costs of Canadian scientific and engineering research publications. For example the multidisciplinary *Journal of the Arctic Institute of North America, "Arctic"* has been receiving an NSERC grant for the past several years.

Conference grants: offer limited support for scientific conferences, symposia and meetings held in Canada and organized by Canadian institutions. Conferences with a Northern interest, receiving NSERC support in 1985 include those entitled *"Offshore Mechanics and Cold Ocean Engineering"* and *"Sea Ice Management"*.

Special grants: NSERC has a very small amount of money to support various other undertakings aimed at the promotion of research. Recently a special grant was awarded to ACUNS to assist with the costs of *the forthcoming (November, 1986) National Student Conference.* Unfortunately the budget for 1986-87 is already exhausted.

SUPPORTING RESEARCH IN THE NORTH

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It was a pleasure to speak to the Northern Offshore and Information Resources Seminar in Yellowknife. I was asked to speak briefly about funding northern research. My remarks were based largely on observations from my own research work and my associations with ACUNS and its Northern Studies Trust of which I am currently Chairman.

I would like to stress the informal and generally provocative nature of my remarks. I did not speak as an expert but rather as one offering food for thought.

In the first place a few words should be said about research directions, about a research agenda. We do not in Canada have any reports like the recent *National Issues and Research Priorities in the Arctic*, Polar Research Board, National Research Council of U.S.A., 1985. In 1972, a Science in the North Seminar was held at Mont Gabriel and some research needs were identified and recommendations made. But nothing similar has been held in this country since. The question arises, therefore, as to whether we need something like the U.S. report. Certainly the Northern Studies Trust Management Committee thought of doing something similar at the start of its work in 1982. However, not too many funding agencies were interested and we simply got on with the job of awarding scholarships on the basis of application quality and general guidelines.

In the 1985 U.S. study some major research priorities — with rationale — are identified. These include: Upper Atmosphere and Near-Earth Space Physics; Atmospheric Sciences; Physical and Chemical Oceanography; Marine Life Sciences; Glaciology and Hydrology; Geology and Solid Earth Geophysics; Permafrost; Arctic Engineering; Terrestrial and Freshwater Biology; Medicine and Human Biology; Social and Cultural Research; and Economics.

If such a list of priorities were being prepared in Canada — for the N.W.T. and the Yukon, for example — I suspect we would wish to add some topics. Examples that come to my mind are Law and Governance; Education or Learning; Land Use, its Environmental and Social Effects; and Communications. I believe that we would also look with favour on international comparative studies as a basis for learning from the experience of others.

Let me now say a few words about funding sources with which ACUNS and the Northern Studies Trust have been involved and on which we have offered comment or advice.

ESRF: Environmental Studies Revolving Fund

This petroleum industry-government initiative has now been in place for several years. Until this year it operated through two committee systems, one for north of 60° and one for south of 60° and Hudson Bay. The former was an Indian and Northern Affairs (DIAND) and the latter an Energy, Mines and Resources (EMR) committee. They now have folded into one committee organized by DIAND.

Up to fifteen million dollars annually reportedly has been available through each of the two committees. The money seems primarily to have been used for short to medium term research projects advertised on relatively short notice. At least two major threads relating first to oil effects through spills and related hazards and second to socio-economic impacts of petroleum exploration and development have characterized the research supported by ESRF. Much of this undoubtedly has been useful to industry in particular.

Two general concerns have been expressed about ESRF by university people. First there is the question as to how much the ESRF is contributing to basic long term research and so to the fundamental understanding important to good planning and management. Second is that while a number of university faculty, programs and centres — such as the Arctic Institute of North America — have benefitted from ESRF, others feel isolated because the short advertising time limits opportunity for some university faculty and groups to prepare good applications.

SSHRC: Social Sciences and Humanities Research Council of Canada

ACUNS has been concerned for some years first about the low stress that SSHRC places on funding master's students in comparison to the Natural Sciences and Engineering Research Council of Canada (NSERC), for example. Second, many members of ACUNS believe that some sort of special funding arrangement — a strategic grant arrangement — is desirable for the North, given its size and national importance. Another reason given for special funding is the relatively high costs imposed by the social, communication, and design requirements of northern social sciences research. Basically a lot of dialogue and consultation is called for with communities. The detailed nature of this consultation is indicated in the procedural guidelines taken from the Ethical Principles for the Conduct of Research in the North of ACUNS (Table 1).

Table 1. Ethics in northern research

From: *Ethical Principles for the Conduct of Research in the North*, Association of Canadian Universities for Northern Studies, Ottawa, Canada, 1983.

Introduction

In too many cases, researchers have worked in isolated communities without regard for the people who live there. Communities have been disrupted, and essential local resources used without consultation. Privacy is difficult in small communities, creating additional problems for participants. Guidelines, or principles, are needed so that research may be carried on with a minimum of friction and social disruption.

The principles proposed here are intended to promote cooperation and mutual respect between researchers and the people of the North.

Northerners are involved with research in several different ways:

1. As research subjects
2. Providing information
3. As part of a research team
4. Using the completed research
5. Identifying research needs

If research is to be explained clearly, conducted ethically, and used constructively, it must be guided by principles that consider all of the above mentioned ways in which Northerners are likely to be involved in research activities.

Principles

1. The research must respect the privacy and dignity of the people.
2. The research should take into account the knowledge and experience of the people.
3. The research should respect the language, traditions and standards of the community.
4. The person in charge of the research is accountable for all decisions on the project, including the decisions of subordinates.
5. No research should begin before being fully explained to those who might be affected.
6. No research should begin without the consent of those who might be affected.
7. In seeking informed consent, researchers should clearly identify sponsors, purposes of the research, sources of financial support, and investigators responsible for the research.
8. In seeking informed consent, researchers should explain the potential effects of the research on the community and the environment.
9. Informed consent should be obtained from each participant in research, as well as from the community at large.
10. Participants should be fully informed of any data gathering techniques to be used (tape and video recordings, photos, physiological measures, etc.), and the use to which they will be put.
11. No undue pressure should be applied to get consent for participation in a research project.
12. Research subjects should remain anonymous unless they have agreed to be identified; if anonymity cannot be guaranteed, the subject must be informed of the possible consequences of this before becoming involved in the research.
13. If, during the research, the community decides that the research may be unacceptable to the community, the researcher and the sponsor should suspend the study.
14. On-going explanations of research objectives, methods, findings and their interpretation should be made available to the community, with the opportunity for the people to comment before publication; summaries should also be made available in the local language.
15. Subject to requirements for anonymity, descriptions of the data should be left on file in the communities from which it was gathered, along with descriptions of the methods used and the place of data storage.
16. All research reports should be sent to the communities involved.
17. All research publications should refer to informed consent and community participation.
18. Subject to requirements for anonymity, publications should give appropriate credit to everyone who contributes to the research.

Definitions

The principles refer to research in its broadest sense, including fundamental or applied sciences. Surveys or monitoring studies would also be included. In general, "research" includes all technological activities in the North. Even mineral and petroleum exploration surveys would be expected to honour the general principles. However, the more detailed principles on informed consent and reporting of research results are meant specifically for researchers and might not apply to all technological activities.

The principles focus on those aspects of science that affect local people, communities and their environment. Even where research does not involve the local people in an obvious way, it may still have effects on the land, water or wildlife of the region, and may thus affect the people indirectly.

The word "community" is not restricted to the area of a settlement. The surrounding land that supplies resources for the settlement, and the people who live on the surrounding land, are viewed as part of the community.

The geographic area of concern includes Yukon Territory, the Northwest Territories, Nouveau-Québec, Labrador and the northern parts of the provinces from Ontario to British Columbia (the Extreme North, Far North, and Middle North as defined by Louis-Edmond Hamelin (1975)). Although the emphasis is on isolated northern communities, the general principles are not unique to the North and most of them could be applied elsewhere.

The possibilities of getting substantial special funding for northern social science research from SSHRC suffer from the fact that the federal government is not likely to increase this agency's overall funding very much in the next four years, except through matching arrangements with the private sector. The matching arrangements do, however, represent an opportunity for university researchers and SSHRC to get together with industry and other private groups on projects of mutual interest.

NSERC: Natural Sciences and Engineering Research Council of Canada

Several years ago ACUNS and other groups worked with NSERC to develop a special logistics fund, to aid holders of NSERC operating grants with the unusually high costs of transport and other costs of biological, chemical, engineering, or other research in the distant North. In 1985-86 sixty-three grants were awarded for a total of $330,000 and in 1986-87 seventy grants were awarded for a total of $330,000. No increase in funding occurred this year. But the arrangement seems to have worked well, and deserves strong support in the face of possible cuts during these economically difficult times. A note on NSERC's programs appears in this volume.

NSTP: Northern Scientific Training Program

ACUNS and DIAND have worked together on the development of this fund for close to ten years. There is an article on it, too, in this volume. Basically it offers logistics or field support to students, mainly graduate students, working in the North under the direction of faculty. The research is often part of thesis requirements. The fund has increased significantly in recent years. In 1982, 285 students from 27 universities were supported by NSTP. Funds totalled $625,000, an average of about $2,200/student. In 1984, $825,000 were distributed to 295 students, an average of $2,800 per student.

> "But funding does not tell the whole story. When NSTP listings are examined by category of study — physical sciences, life sciences, social sciences and 'other' ... Of the 27 universities which received NSTP funding in the stated three-year period, 22 carried out work in the three categories of physical, life and social sciences. ... Nine institutions did work in all four categories: the University of British Columbia, Calgary, Carleton, Manitoba, McGill, Université de Québec à Trois-Rivières, Toronto, Waterloo, and Windsor.
>
> In terms of the total funding allocated to each of the four research categories ..., the emphasis on physical and life sciences prevalent in earlier years of university research in the North has given way to a broader coverage of subject matter, ... Yet, social sciences are still neither represented in the north in proportion to their levels of activity on southern campuses nor, in the opinion of some members of the academic community, to the degree that social science research and education is now needed in the North." (*Northline*, vol. 5, no. 4, October 1985).

NEDP: Native Economic Development Program

In 1985-86 ACUNS, through its Northern Studies Trust, and with support from the federal government's Native Economic Development Program, inaugurated a Native Economic Development Scholarship program. The awards were intended to stimulate and support interest in business, commerce, and management among young native people. The selected means of doing so was through a series of $10,000 annual awards for appropriate studies at the master's level.

One hundred and twenty-five thousand dollars were made available for these awards and associated administrative costs in 1985-86. Six awards have been made and four more are anticipated in the near future. Another $125,000 has been allocated by NEDP for ten awards for 1986-87.

NST: Northern Studies Trust

The NST was established by ACUNS in 1982 with initial funding from Donner Canadian Foundation. The Donner grant was a matching one. It required the Trust to raise certain amounts annually in order to receive specified proportions of the $400,000 Donner grant over a four year period.

Three types of awards are available through the NST which has as a major aim the encouragement of young people from a wide variety of backgrounds to undertake work which will permit them to contribute to the North on a continuing basis. The *Studentships* awarded by the Trust to regularly enrolled university students have been the main means of meeting this objective. However, the Trust also encourages research and study by more senior people and by northern residents. To meet these ends it provides *Senior Fellowships* and *Special Awards*. The former are available to established scholars, the latter to northern residents — who may or may not have university qualifications — to make use of universities in the south. More details on the NST programme are available in *Northline*, vol. 5, no. 3, July 1985.

The response to the Trust, especially from applicants for Studentships, has been excellent. Over ninety high quality applications were received in 1985-86 from young people in a number of disciplines and fields at the undergraduate and graduate level. Since 1982 the Trust has provided ten Special Awards, twenty-one Studentships and two Senior Fellowships. In doing so, the Trust has received support not only from the Donner Canadian Foundation, but also Gulf Canada Ltd., BP Canada Inc., Suncor Inc., Petro-Canada, the MacMillan Northern Canada Trust, the Samuel and Saidye Bronfman Family Foundation, La Société March, the Laidlaw Foundation, the Clifford E. Lee Foundation, the Senator Norman H. Paterson Foundation, the Canadian National Sportsmen's Shows, the CSL Group, the Royal Canadian Geographical Society, Shell Canada Ltd., Strathcona Mines, Télésat Canada and TransCanada Pipelines. In addition, personal contributions have been received from a number of university faculty and other individuals.

Other sources

A number of other sources of funding are available for

Northern Research but not much is known about them or the results of the research they sponsor. Some interesting new sources of information are emerging in this regard; for example, *Infopall*, a service provided by Pallister Management Services (see paper in this volume). *Infopall* lists and sells copies of reports completed by industrial or consultant groups under the ESRF, Arctic Petroleum Operators Association (APOA), or other programs. Native organizations are also funding research for various purposes. The Science Institute of the Northwest Territories (paper in this volume) is supporting a variety of research in the biological, physical, and human sciences. Many of these funding agencies do not provide grants on a regular basis but fund research for specified purposes through contracts.

Other sources of private sector funding include World Wildlife Fund Canada, Canadian Arctic Resources Committee, and a variety of foundations with northern interests. Notable among the foundations is Donner, which has made a major contribution to northern research and information needs. I have not had time nor resources to study and report on all available opportunities here.

I would like to leave you with one or two thoughts. These are set against the idea that northern research funding is going to be increasingly difficult to secure for several years at least, given continued economic difficulties in Canada and the low price of oil.

Is more co-ordination in research support not needed in order to provide adequate funding from limited sources? If so, is there not a need for more knowledge of the funding opportunities and the way that they complement or fail to complement one another? An example is the lack of sufficiently good fit between NSTP and SSHRC programs. Is there not a need to work to make the funding opportunities more interactive and effective? How can this be done? Should more informal interaction occur through agencies such as ACUNS? Does a body like the Polar Institute currently proposed by DIAND have a role here? If so, what should this be?

The best opportunity for creative and sensitive response — especially to local or regional needs — may lie in a system which encourages many agencies of different kinds while avoiding heavy direction from one source. At ACUNS we would be especially interested in working with other groups through NST and other means. More sharing and more brokerage seems essential.

Note

It was felt that this address to the NOIR Seminar in Yellowknife was more appropriate in this section of the volume. Readers might find the following useful for following up Dr. Nelson's points (ed.).

Northline is ACUNS' newsletter.

The address of the Polar Research Board of the U.S.A. is: Polar Research Board, 2101 Constitution Ave. N.W., Washington, D.C. 20418, (202) 334-3479.

HIGHER EDUCATION AND RESEARCH IN THE NORTH
A MINING PERSPECTIVE

David Nutter

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Introduction/Background

Mining in the Canadian North has a long and colourful history. In the 1570's, Martin Frobisher returned from three voyages to the arctic islands with large quantities of rock specimens — reported to be gold-bearing. No gold was ever recovered, and his mining ventures to the New World ceased. Later explorers, such as Samuel Hearne, journeyed across the North in search of the legendary copper mines which had supplied the Indians with their copper implements for centuries.

In the late 19th century, gold-seekers en route to the Klondike, noted the presence of lead and zinc on the south shore of Great Slave Lake. Gold was also reported in the vicinity of the Yellowknife River, but this news attracted little interest.

Investigating descriptions by the Geological Survey of Canada of copper and cobalt sightings on the west shore of Great Bear Lake, Gilbert LaBine staked several showings on the shores of Echo Bay. These claims became the Eldorado Mine which, at various times between 1933 and 1982, produced radium, uranium, silver and copper. This was the first commercial mining operation in the Northwest Territories. Mining in the NWT became firmly established in 1938 with the pouring of the first gold brick at the Con Mine in Yellowknife.

Nearly 50 years later, Con is still a major gold producer, contributing to the more than 300 tons of gold recovered to date in the NWT — valued at more than four billion dollars at today's prices!

In 1985, the NWT produced fifteen per cent of Canada's gold, and Echo Bay's Lupin Mine at Contwoyto Lake was the third largest gold mine in Canada. Also of historical note, in November, 1985, Giant Yellowknife Mines celebrated the pouring of 10,000 gold bricks, or 5.7 million ounces of gold, during nearly 40 years of production.

In the spring of 1986, there are eight major mining operations in the NWT as well as several smaller, seasonal producers. Their estimated value of mineral production in 1985 was 600 million dollars. This represents seven per cent of Canadian production — a significant accomplishment for 0.2 per cent of the nation's populace. Gold, lead, zinc and tungsten are the principal minerals currently produced in the North.

Mining directly employs 2,350 full-time workers, 1,850 of whom are northern residents. Our industry is the largest private sector employer in the Territories, and their wages contribute more than 80 million dollars to the Territorial economy.

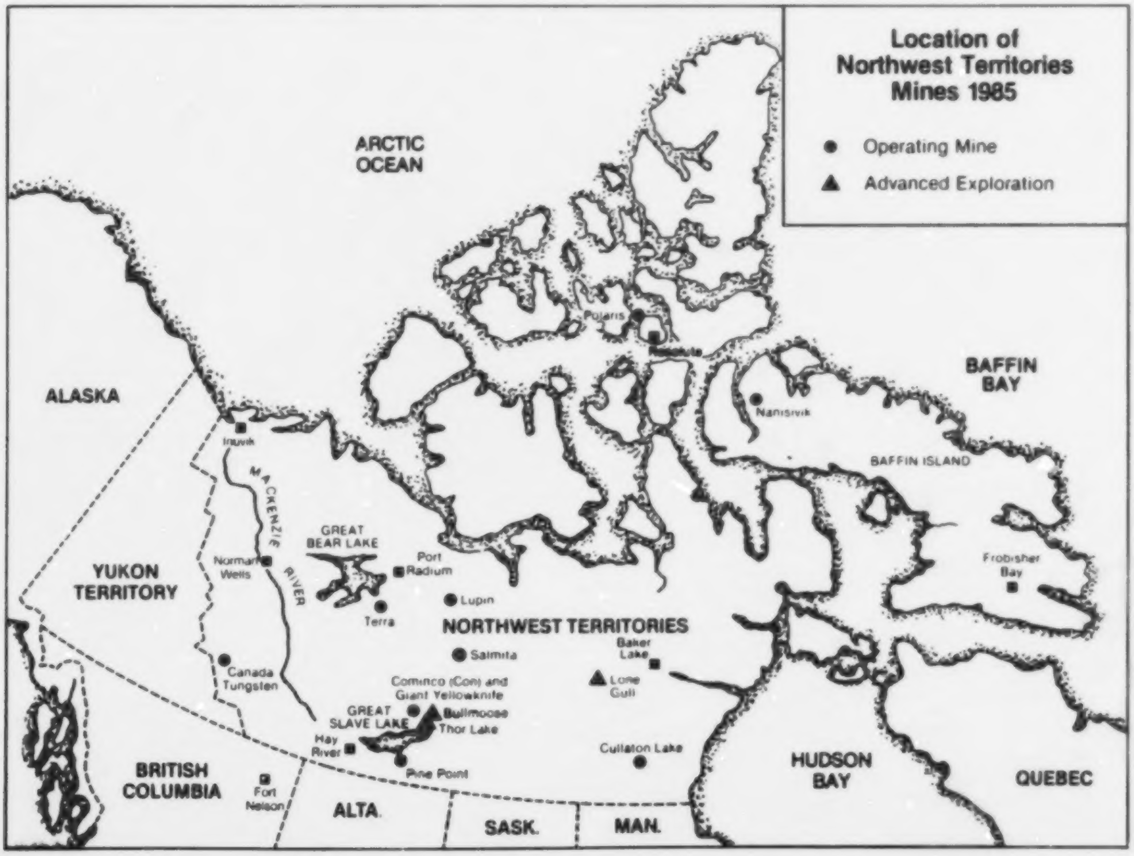
The geology of the Northwest Territories favours the discovery and development of a wide variety of mineral commodities. Occupying a third of Canada, the NWT is underlain by three principal geologic structures: the Precambrian Shield, the Interior Platform and the Cordillera. The Shield, covers most of the mainland east of a north-south line extending from the arctic coast near Coppermine, across Great Bear and Great Slave Lakes and passing into northeastern Alberta, just east of Pine Point (see Map). The Cordillera occupies the western edge of the NWT, between the Mackenzie River and the Yukon border. Platform rocks are found between the Shield and Cordillera, as well as underlying much of the Arctic Islands.

Ancient volcanics, sediments and intrusives of the Precambrian Shield have been the focus of extensive precious and base metals exploration, and our four gold mines (Con, Giant, Lupin and Salmita) are all hosted by these rocks. It is estimated that 80 per cent of the 40 million dollars currently being invested in annual mineral and exploration across the NWT is concentrated on the search for gold between Yellowknife and the arctic coast. There are also major efforts in progress to achieve production at significant beryllium yttrium rare earth element (Thor Lake) and uranium (Lone Gull) properties in this region. Two former producers, Terra (silver) and Cullaton Lake (gold) are currently on standby, awaiting higher commodity prices.

The Cordilleran sediments have been Canada's principal source of tungsten for many years. Copper, lead, zinc, gold, coal and iron deposits have also been identified, but they are currently not economic to develop.

Platform sediments of the NWT host some of Canada's principal lead zinc deposits, and three world class mines are presently producing at Pine Point, Polaris and Nanisivik. Diamonds, coal and copper deposits have also been located in the Arctic Islands.

Turning now to the theme of ACUNS' conference upon which this volume is based, "Higher Education and Research in the North":


Location of Northwest Territories Mines 1985
● Operating Mine
▲ Advanced Exploration
ARCTIC OCEAN
BAFFIN BAY
Polaris
Resolute
Nanisivik
BAFFIN ISLAND
Frobisher Bay
ALASKA
Inuvik
MACKENZIE RIVER
GREAT BEAR LAKE
Port Radium
YUKON TERRITORY
Norman Wells
Lupin
Terra
NORTHWEST TERRITORIES
Baker Lake
Salmita
Canada Tungsten
Cominco (Con) and Giant Yellowknife
Lone Gull
GREAT SLAVE LAKE
Bullmoose
Thor Lake
Hay River
Pine Point
Cullaton Lake
HUDSON BAY
QUEBEC
BRITISH COLUMBIA
Fort Nelson
ALTA.
SASK.
MAN.

Mining-related research

The current level of mining industry support for and participation in mining-related research is constrained by a critical dilemma which confronts our industry. On one hand, our competitiveness and long-term survival depend on continual development of new technology. However, market conditions during the past decade have placed most operators in a survival mode where research and even exploration have become luxuries.

Geology

Much of the research in this area is carried out by university-sponsored organizations, with the financial support of government — particularly, in the North, the support of the Federal Department of Indian Affairs and Northern Development. There has been, over the past six years, an annual average of twelve university-based, geological research projects in the NWT, focussing on such areas as geological mapping, mineral deposit studies and surficial geology investigations. Over this time, this work has produced twenty-four Open File maps and reports, and more than forty-five papers. In addition, eleven Master's and twelve Doctoral theses are completed or in progress. Such research generally results in a high calibre of work at a low cost which could not be duplicated through consultant contracts or by in-house government or industry personnel. Unfortunately, budgetary cuts within government have resulted in reduced funding in this area.

Mining

Most mining research appears to be process related, focussing on operating problems, with little work devoted to developing new technology.

One question which is frequently debated by both researchers and developers is whether R & D devoted to new technology should be carried out in the North or transferred from southern Canada. There are strong arguments for both options. Due to its remoteness and the harsh climatic conditions, northern on-site research is often more costly and time-consuming. There are costly examples of innovative and untested technology being introduced to northern operations, where isolation resulted in costly delays when the process proved unsatisfactory. In many fields, technology developed to respond to problems at southern-based mines can be readily transferred to northern operations. On the other hand, permafrost and sea ice conditions, and the operating challenges they pose, require northern-based study and experimentation.

Our most northerly mines, Nanisivik and Polaris, have a long history of research into cold temperature engineering and the stabilization of ground conditions when mining in permafrost terrain, collaborating with such organizations as the Université de Sherbrooke and EBA Engineering. However, there are still many difficulties encountered in the North whose resolution would benefit both mining operations and communities, for example the design, construction and stabilization of dock facilities in the high arctic. This latter problem has been tackled by the petroleum industry, and their work may be transferable.

Environment

When addressing environmental issues related to water, flora and fauna, there is rarely sufficient site-specific data to satisfy baseline or impact assessment requirements. Thus, the public review and licencing process for a northern operator becomes contentious and protracted.

Transportation

In the area of arctic shipping, there is ongoing research into attempts to extend the shipping season. Most operators contend that shipping later into the winter months brings on significant problems related to darkness, falling temperatures and deteriorating weather conditions. Rather, they feel that the problems of moving through heavy ice should be tackled, with the aim of advancing arctic transit into the spring when days are lengthening, temperatures are on the rise and the weather is generally more stable. At the same time, when developing the equipment and techniques which would lengthen the shipping season, researchers must weigh the costs and benefits to the mine operator of these advances against the reduction of storage costs. Is it possible that, well into the future, we may be contemplating the introduction of submarine freighters?

In summary, we should take heed of the opening remarks by the Hon. Dennis Patterson (see elsewhere in this volume) that northern research must focus on northern needs.

Mining-related education and training

The mining industry contends that basic education, which prepares people to enter the workforce, is the responsibility of government; whereas, training which enables individuals to become skilled members of the work force is the joint responsibility of employers and government.

Many of our mine operators have found that their principal challenge is not in the area of technical training. Job skills are generally acquired very quickly. Rather, the social skills such as "learning to work", taken for granted in the south where general life skills are adopted in day-to-day activities, must be introduced to many northerners seeking to enter the workforce. In an attempt to reduce its high turnover rate, Nanisivik has developed a 10 week "pre-employment" course which introduces banking, working regular hours, how to cope with money, etc.

One questions whether this is the role of the employer.

Perhaps the education system should do more? The private sector has identified a need for greater skills training (i.e. practical education) prior to entering the workforce.

Recently in the north, the quality and applicability of our schooling has been questioned. ("When is a Grade 12 a Grade 12?") Employers need to know what they are dealing with. What compromises, if any, are being made? What will be the long term effects?

On the job site, there are considerable translation problems. Many technical terms do not exist in aboriginal languages, leading to problems and misunderstandings.

For example, in the North, the term "heavy metal" is frequently translated as "poison". Without adequate communication, northerners will not receive the necessary education. The mining industry recognizes that a sound, broadly-based education system across the North is in its own self-interest. By knowing and understanding all of the facts, northerners will come to accept and support the role of mining in their society.

Turning to the question of training, northern employers recognize that they have a role in preparing northerners to replace southerners on the job site. Mining's training record surpassed that of most industries prior to the recent economic downturn. We initiated modular training which is transferable between northern mining operations.

Since 1977, Nanisivik has trained more than 600 northerners in a wide variety of trades and skills. But many workers, including northerners, have used their northern apprenticeship as a training ground for future southern employment.

Most mines have difficulty in finding enough qualified northerners to enter their apprenticeship programs. Some operators have even lowered their entry level from Grade 10 to Grade 8. Many of the best candidates are already employed, and the mines are reluctant to pillage the communities of their most qualified workers. In addition, those entering mine training programs are most frequently young and single; whereas, the middle-aged applicants, supporting a family and perhaps in greater need of employment, often can not satisfy the minimum entry requirements.

Supervisory personnel at our northern mining operations most commonly have come from southern Canada. Few northerners have gained sufficient experience to fill these positions. However, with their southern backgrounds, these leaders do not understand or appreciate northern culture and attitudes — which may lead to conflict between workers and staff. There is a real need for "cross-cultural" courses directed towards supervisors. Such programs have been attempted in the past but not maintained. With the vast amount of study by the academic community devoted to northern social development, surely they could lend assistance in this area.

In his opening address to the ACUNS' conference, the Hon. Dennis Patterson urged southern educational institutions, particularly at the university level, to accept transfer of credits from our northern-based Arctic College. I have personal experience in this area as a member of the Advisory Committee to the Public and Business Administration Program of Arctic College (Thebacha Campus). In recent years, the PBA Program has made considerable gains in program recognition, arranging transfer credits with a number of other community colleges, universities and professional organizations. These include: the Society of Management Accountants, the Certified General Accountants' Association, the University of Saskatchewan, McMaster and Athabasca Universities. This wide acceptance is particularly pleasing to the PBA staff and students.

In closing, it should be noted that the North is characterized by a high birth rate and a young population. Native northerners have witnessed and undergone a dramatic cultural change in the last 1-2 generations. The educational and training difficulties noted above have meant that job opportunities may be limited for many northerners, leading to serious social challenges. Mining is not the complete answer. We recognize that the majority of the population in the North, as is the case in southern Canada, will not choose to work in mining. We must not attempt to force this career path on them. Rather industry, government and educational institutions have the joint responsibility of ensuring that all northerners gain the opportunity and qualifications to follow through with their chosen careers.

THE YUKON SCIENCE INSTITUTE, PLANS AND OBJECTIVES

Art Pearson

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The Yukon Science Institute (YSI) was registered as a non-profit organization under the Societies Ordinance of the Yukon Territory on April 1, 1985. However, the need for a focal point for promotion and support of science and research has been an identified embryo for several decades. It has been discussed at successive Arctic Science Conferences and before that, at a number of workshops and meetings concerned with northern science. Sister jurisdictions in the Northwest Territories and Alaska had already established one or more organizations to independently address questions of science common to the north in general.

The Yukon Science Institute was created independent of government and designed to represent a reasonably broad constituency of Yukoners with accommodation for minority representation from outside the Yukon by those with a Yukon interest.

The first and paramount objective of the YSI is "to encourage, promote and support research on scientific, engineering, medical and socio-economic matters that will contribute to the achievement of the social and economic goals of the people of the Yukon Territory".

It was clearly stated that science is taken in the broadest possible context including, but not limited to natural sciences, engineering and technology, physical sciences, political and social sciences and medical health sciences.

To facilitate the objective, the YSI has identified six major activity areas wherein a lack of focus, promotion and action warrants the Institute to explore program initiatives. Those areas are: scientific research in Yukon through funding, facilitating, or undertaking; a scientific advisory role to government and its agencies or to private institutions, companies and foundations; academic science education at the secondary and post-secondary levels; research and science data information system development in the Yukon; science promotion, coordination and leadership through communication, consultation and cooperation with other agencies, institutions and researchers interested in the Yukon; public education through media such as lecture series, radio programs, conferences and printed material.

None of the programs thus far suggested fit solely within a single activity area and it is not intended that this be so. The sole purpose of identifying a lead activity area for each program is to target organizations or agencies that could assume responsibility for that program.

The program initiatives identified herein are presented to initiate and stimulate discussion and to obtain feedback and suggestions from persons, agencies, institutions and other organizations interested in any way in these matters in the Yukon. The institute solicits comments on any or all of the identified programs and seeks additional suggestions for further programs. The ultimate goal is to priorize the programs in short and long term significance for the Yukon and to act thereon.

Scholarly chairs for science

The concept envisions creation of positions for visiting scientists from a diversity of disciplines. Source of scientists and funding for support would depend on the discipline and the significance in Yukon priorities. Many options exist. Professors could be encouraged to bring graduate students creating a quasi-graduate institute in the Yukon.

While in the Yukon, these persons could carry out significant research of their own, thus increasing the knowledge of Yukon scientific phenomena. In addition, they would create interest and stimulate curiosity and understanding in the community about their areas of expertise.

Objective third party research

The encouragement and support of objective, unbiased research could provide a source from which agencies, organizations and government could obtain non-protagonistic advice on important contentious issues in the Yukon.

Such research would be conducted by parties responsible for seeking the truth rather than advocating any particular position. The results would be advisory in nature to the requesting body and all data would be open for review. The work could be contracted or scientists could be hired to perform the research.

Public awareness

Promotion of science is essential to a better understanding of our environment and how science and research can improve the quality of our existence. Interest can be created through radio and television shows using local and external experts. Lecture series on science are valuable. A list of guest speakers can be created for use of any interested Yukon groups. Newspaper and magazine articles can create interest in Yukon science both within and outside the Yukon.

Local science workshops, seminars and conferences stressing local participation of the general public would elevate the awareness and importance of science and research. Local issues could be addressed with the view that scientific research is a logical vehicle for study, examination and solution involving Yukon people in decision making.

Post-secondary education

Scientists working in the Yukon, particularly if seconded for a period of time, could contribute by delivering structured courses in specific disciplines. Eventually, courses would be accredited through home universities or colleges and contribute to Yukon College stature. Graduate students accompanying visiting professors could benefit from academic courses and post-secondary directed research under practical conditions especially suitable to the north.

Science consultation and coordination

Scientists' interest in the Yukon and the potential research challenges most often have to formulate proposals without input from the research area. Overlap of projects, relevance of topics and comprehensiveness of proposals are areas which can be improved through consultation and coordination through a local body.

Documentation and cataloging of past and present research, recording of results, communication among researchers with common interests and encouragement of the Yukon's scientific community require assistance.

Encouragement of student involvement

Practical experience of high school and post-secondary students in field programs would stimulate interest in science in the Yukon and encourage furtherance of academic studies. A line of communication between potential field assistants and researchers would facilitate and accelerate this process.

Conferences and meetings

Scientific conferences of national and international stature addressing northern issues could be hosted in the Yukon, thus elevating interest and knowledge of the Yukon and its people. Meetings of scientific and academic societies and associations could be encouraged to view Yukon as an ideal place to hold workshops, meetings and conferences. A focal point to actively promote these activities is essential to successful attraction.

Data information service

Currently the information base for the Yukon and other northern matters rests in southern and Alaskan institutions. A library on science in the Yukon associated with a solid historical archives and connected to "outside" institutions through electronic information retrieval systems would create a focal point for researchers and attract scientists to the area.

Electronic access of data in rural Yukon would accommodate residents and researchers.

Yukon science publications

Research results and science information relative to the Yukon is spread through innumerable journals, magazines, files and unpublished reports. A journal or bulletin for publication of such information in original or precis form would provide a vehicle for scientists focusing on Yukon issues and stimulate interest locally, thus encouraging and promoting the Yukon scientific community, and would promote a positive scientific image in the Yukon.

Recognition of scientific excellence

Recognition could focus on senior high school academic or science project accomplishments, undergraduate or graduate performance by Yukon students, research and science achievements relevant to the Yukon and individuals or organizations contributing to the advancement of science and research in the Yukon.

Public school participation

Science programs in Yukon schools could be boosted by promotion of field trips to ongoing research projects. Guest scientists could provide invited lectures in conjunction with current school programs. Career days could be used to promote futures in science and research.

Yukon scientific research centre

Program initiatives outlined here and other direct research applications could be facilitated and accelerated by a facility dedicated to the promotion of science in the Yukon.

Note

This paper was written in November 1985. It is printed here to stimulate interest in science in the Yukon. Dr. Pearson would appreciate suggestions (ed.).

HIGHER EDUCATION AND TRAINING IN THE NORTH WITH A FOCUS ON ARCTIC COLLEGE

HIGHER EDUCATION AND TRAINING IN THE NORTH WITH A FOCUS ON ARCTIC COLLEGE

Neither the Yukon nor the NWT has a university although there is a fairly well documented history of the *idea* of a university of the North in Canada. Both Territories are developing a college system, in the NWT this system is Arctic College with its various campuses. As the articles by Stapleton and Cleveland attest, an enormous amount of effort is being channelled into the development of Arctic College. It is a young institution which has to cater to a very diverse, sparse, population spread over a region which is larger than most countries. It is important that the universities and colleges of the provinces of Canada do all they can to assist Arctic College. The organization of Education in Canada is such that the Territories are faced with a myriad of diverse institutions of higher education in at least ten jurisdictions. Each jurisdiction, indeed each institution, has its own programs, students and procedures (see, for example, the article by Gillmore and Giberson, elsewhere in this volume). The profiles of member institutions of ACUNS, in the last Section of this volume, are provided to assist northerners in finding their way through the university maze. These profiles provide a glimpse of the diversity with which northerners are faced. And yet ACUNS' thirty-five members form less than half of the total number of universities in Canada. There are, in addition, some hundreds of colleges.

The Workshop on Higher Education and Training (see following article by Stapleton and Nielsen) tried, among other things, to address the matter of links between Arctic College and the universities and colleges of the South. ACUNS has begun to address some of the recommendations which the Workshop generated (see note at end of the Stapleton and Nielsen article) but it has to be stressed that the Association, as presently constituted, is *not* a major player in the overall university 'system' of Canada (ACUNS' scope is outlined in the article by Tremblay). It can advise and facilitate but it has no real power to implement in many areas. Each of its member institutions is jealously autonomous.

As Higher Education is still at a developing stage in the North, "Training" of adults is of great importance. The well known and long established training program of Arctic Co-operatives Ltd. (article by Lyall) pioneered managerial training in the Territories. As is often the case, the success of such programs is measured by the extent to which their graduates are lured away! Arctic Co-operatives personnel are now to be found throughout the North in positions of responsibility which have nothing to do with co-operatives. No doubt the newer Nunasi training programs (article by Tungaluk) will be equally successful! From discussions at the Yellowknife meetings upon which this volume is based, I would hazard a guess that the Kativik and EATEP teacher training programs (see Section on Teacher Education and the North) may well be the major vehicles for 'training' in the North today. It will not be long before graduates of these programs are being drawn from the classroom into all levels of community and Territorial life.

The last article in this Section (by Stonechild and McCaskill) does not deal specifically with Higher Education in the North. It was solicited because of the great interest in Native Studies which became apparent during the Yellowknife meetings. A majority of universities in Canada now offer Native Studies courses of some kind, many have full fledged Native Studies Programs. The Programs form an important academic component of the universities concerned and they have also become an important stepping stone for native students who wish to become involved in university education in the South. Through the programs, it is now possible for native students to build on their knowledge of their own cultures, including language, to obtain a university diploma or degree. The programs provide both academic and social counselling. Professor Blair Stonechild, of the Saskatchewan Indian Federated College, is President of the Canadian Indian / Native Studies Association (CINSA) which is the national organization of Native Studies programs. He is a useful point of contact for those interested in Native Studies. His address and 'phone number are provided at the beginning of the Stonechild and McCaskill article. The university profiles in the last Section of this volume include a good deal of information on Native Studies in ACUNS' member universities.

HIGHER EDUCATION AND TRAINING IN THE NORTH — SUMMARY OF A WORKSHOP IN YELLOWKNIFE

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The workshop was attended by 31 individuals (Table 1) and focused on the general question of post secondary education in the north as well as the role of Arctic College in its delivery. Topics which received particular attention were indigenous post secondary education in the north and how northern research could support education.

Table 1
WORKSHOP ATTENDEES

Name	**Affiliation**	
Bill Stapleton	Arctic College	Co-Chairs
Ole Nielsen	University of Guelph	
Marie Lessard	University of Montreal	
Dennis Stossel	AES — Winnipeg	
Marc-Adélard Tremblay	Université Laval	
Robert Moore	Dalhousie University	
Gordon Nelson	University of Waterloo	
Josef Svoboda	University of Toronto	
John Stager	University of British Columbia	
Allan Gillmore	AUCC	
Linda Lange	University of Alberta	
Wayne Rouse	McMaster University	
Marianne Stenbaek	McGill University	
Robert R. Janes	Science Institute, N.W.T.	
Peter Schledermann	Arctic Institute, University of Calgary	
Robert Doherty	Public Works & Highways, G.N.W.T.	
Mike Bell	N.W.T. Housing Corporation	
Roger King	University of Western Ontario	
Robert Gilbert	Queen's University	
Jim Basinger	University of Saskatchewan	
Jim Fenwick	University of Ottawa	
Jackie Wolfe	University of Guelph	
Doris Winkler	Kativik School Board	
Jocelyn Lillycrop	NSERC	
George Hobson	P.C.S.P./EMR	
Fred Roots	Department of Environment, Ottawa	
Joseph R. Potvin	Scott Polar Research Institute, Cambridge	
Ron Mackay	Concordia University	
Leslie Green	Department of Local Government, G.N.W.T.	
Robbie Keith	University of Waterloo	

The following is a summary of comments made during the workshop.

In the Northwest Territories, the organization charged with post secondary education is Arctic College. The southern universities represent a dispersed "surrogate university" that is loosely associated through ACUNS. Heretofore ACUNS members have largely been concerned with research and not education. It was pointed out that some universities appear to view the north simply as a laboratory.

The President of Arctic College, outlined the need for immediate action in providing training programs for northerners. This need could be partially met by existing academic programs in the south combined with job experiences in the north. He posited that skills required "to get the job done" are not taught at southern institutions. Two possible solutions are:

1) have southern institutions create and teach, in the south, courses that are geared to solutions to northern problems or
2) have northern students take existing courses in the south supplemented by new courses which focus on northern problems, developed at Arctic College.

The need is believed to be immediate and can not wait for several years while Arctic College develops appropriate courses on its own. While Arctic College does not wish to reinvent the wheel it recognizes that all northerners' needs cannot be met by its existing programs.

Arctic College has had to accommodate the needs of students with a wide variety of educational backgrounds by providing programs from early high school level through to that equivalent to first year of university. Because of its unique geographic, cultural and resource setting, post secondary education in the north calls for innovation if it is to be properly adapted to this region.

Of particular concern among northerners is the need to provide for leadership training.

The problem of culture shock for northern students in the south was recognized. It was pointed out that social support for such students is extremely important. It was advocated that higher education begin with study in the local community from which the study of that which is universally true can proceed. Culture depends largely on family. Therefore, if students are separated from family for an extended period, e.g. if training requires upwards of ten years in the south, there is a large problem to be solved.

It was recognized that education can be an important route to self-fulfillment as well as economic well-being. Northern students must have goals appropriate to their culture and the educational process must adapt to allow them to achieve an education in this context.

Higher education must be made more accessible to northerners and tailored to their particular needs. For example, there has been a whole generation of northern school teachers who have no post secondary university degree but who function very well in the north. Unfortunately university courses of interest to such individuals are often at the graduate level. As a consequence northern students do not have access to such instruction. In this case perhaps some form of special education needs to be provided. The desirability of being able to grant academic credit for achievements in informal settings was noted. However the problem of recognizing and judging academic achievement outside a formal setting was considered difficult to solve. Such problems must be solved in a "language" that is common to all participants in the education process.

There is not enough awareness among northern students of opportunities for employment in northern communities. Indigenous students need to get out into the work force and to get some sense of opportunities that are open to them and some experience beyond the community in which they have been raised. Many native northerners do not see many of the developments in the north as an opportunity for them. Some may believe that land claims will assure their future rather than education.

The "co-op" system at the University of Waterloo was described. It includes both academic and work terms for students. In this program there are professional co-ordinators who work with external employers in structuring appropriate work experiences. This requires a lot of effort to make sure that the system works. Students in this program work all over Canada and abroad. Some of the principles in such co-op programs might be used effectively for providing northerners with education appropriate to their needs.

Co-op programs provide a means for the student to learn from the work place as well as from academia. For northerners the model of co-op education must be studied so that objectives are clear. Northerners need to define areas in which they lack knowledge. The ACUNS can be an important link in bringing scientists and graduate students into contact with these kinds of problems. Co-op programs could be based on work in industry, government, or projects funded by research agencies.

Southerners should be encouraged to learn from northerners rather than vice-versa. Perhaps local communities could collect data and materials for study. They could also maintain a list of research topics developed in association with local government departments. In collaborative projects, local or regional groups must be involved in the planning rather than seeking their agreement after the fact.

Co-op education conducted in connection with community-based research in rural and community planning requires a strong commitment to research by both parties, namely those doing the investigating and those who are the subject of study.

It was mooted that it might be reasonable to establish a "co-op learning council" which would bring together universities, government departments, Arctic College and industry. The desirability of some special way of funding co-op education for northerners was recognized.

The workshop briefly reviewed a number of different models of educational institutions and programs that might be of interest to Arctic College. These included the Saskatchewan Indian Federated College, Regina, the College of Cape Breton, Lakehead University and others. The opportunity to learn from such institutions was considered worth pursuing. It was agreed that Diploma education could be a very important link leading to higher education.

It was pointed out that community colleges are more coordinated in their offerings in contrast to the universities which are autonomous and whose offerings are not very carefully integrated with other institutions. The Association of Community Colleges of Canada (ACCC) was considered an important organization with which Arctic College should have close liaison. ACCC might be used as a route to interface with southern universities.

The workshop felt it essential for Arctic College to work closely with the Science Institute of the North. SIN could act as a clearing house for placing students, both graduate and undergraduate, in research teams that would provide optimal education. SIN could also provide a network of experts for teaching co-op programs.

The ACUNS represents an important link for the north and Arctic College with Canadian universities. Furthermore ACUNS might seek closer ties with AUCC and thereby focus more attention on the needs of northerners and of Arctic College. Constituent groups of AUCC who have potential influence in northern education could be invited to hold their meetings in association with that of ACUNS; for example the Association of University Registrars.

The ACUNS could lobby for cheaper and better data lines into the north and suggested that experiences in the Alaska Northslope Borough would be worth investigating.

The ACUNS can provide leadership in exploring means of making university courses of interest to northerners more "portable."

The University of Alaska might be worthy of study as a well developed northern university system which is already becoming familiar to northern Canadians.

Ultimately ACUNS working together with Arctic College can support the realization of the dream of an indigenous northern university sometime in the future.

Recommendations

1. That northern leaders strongly encourage higher education for northern youth while southern institutions for their part ensure they have the flexibility to adapt to the needs of northern students.

2. Arctic College should consider offering segments of courses to prepare students for their northern work, because southern universities' students coming to work in the north are often inadequately prepared, due to the lack of northern content in the courses.

3. There is need to develop some form of university presence in the north, a place where people can go for help and answers to questions.
4. Arctic College should consider adjunct professors from southern universities to supplement its teaching staff.
5. There is a need for social support for northern students while they are attending universities in the south.
6. That the constituent groups of Arctic College and Science Institute of the N.W.T., community groups, agencies of Government of the N.W.T. and ACUNS seek closer ties with a view to exploring the linking of northern needs (e.g. research, training, information) with the interests of southern universities.
7. That Arctic College and Science Institute investigate the possibility of establishing a Cooperative Learning Council to explore the opportunity for cooperative learning experiences.
8. Plan cooperative research projects with northerners.
9. That northern research activities be carried out in a cooperative manner with local informants thus leading to greater learning opportunities for both sides.
10. That the working relationship between Arctic College and Science Institute be established as soon as possible.
11. That ACUNS seek affiliation with AUCC possibly as an associate member.
12. That Arctic College seek closer links with ACUNS and AUCC.
13. That, in time, ACUNS might want to seriously consider establishing a Northern Office in Yellowknife for Arctic College and Science Institute Liaison and/or looking at other ways and means of increasing links with the North.
14. That ACUNS examine means of making southern courses more portable.
15. That means of providing cheaper and easier access to a wide range of information be explored with a view to meeting the needs of the North.
16. That ACUNS meet in the Eastern Arctic.
17. That the President of Arctic College be invited to participate in the subarctic universities meetings of June 1986.

Note

Readers of this Summary will be interested in articles elsewhere in this Section and in other Sections, some of them solicited as a result of discussions in this Workshop. For example, Saskatchewan Indian Federated College is described by Stonechild and McCaskill in an article which includes discussion of pre-degree diplomas. Profiles of two universities mentioned, Lakehead and Waterloo, appear in the last Section of the volume with an article on the AUCC by Gillmore and Giberson. There is an article on the still new Science Institute of the N.W.T. in the Section on Education and Research. Some of the University of Alaska's work is covered in the Section on Distance Education.

Since the Yellowknife meetings, ACUNS has applied for Associate Membership in AUCC., as recommended here, and we have begun to circulate 'wish lists' of research projects supplied by northern groups (see Introduction to Education and Research Section). Developments described in the Section devoted to Teacher Education in the North, especially those involving the Kativik School Board (article by Padlayat and Winkler) and the Eastern Arctic Teacher Education Program (Wilman) will be of particular interest to those concerned about appropriate university education *in* the North. (ed).

CHALLENGE AND CHANGE: THE DEVELOPMENT OF POST SECONDARY EDUCATION IN THE N.W.T.

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Introduction

Post-secondary education in the Northwest Territories, until fairly recently, evolved in a somewhat ad hoc way. During a period when the priority was seen to be the need to develop an effective school system throughout the Territories and when high school graduates were few in number, adult education and training consisted primarily of upgrading programs and vocational training in such areas as secretarial skills and heavy equipment operation. These programs were brought together in the late 1960's with the establishment of the Adult Vocational Training Centre in Fort Smith.

Adult Vocational Training Centre (AVTC)

AVTC came about as a result of a somewhat unusual coincidence. Harold Darkes, the Regional Superintendent of Education in Fort Smith at the time, had made a deal with Precambrian Mining Company to purchase a closed down prospecting and exploration camp located on the Little Buffalo River near Fort Resolution. This group of trailers was hauled out of the bush, moved into Fort Smith and parked in the Department of Public Works compound. At about the same time, someone in Ottawa had the idea that it would make good sense to deliver a heavy equipment operator training program in the North instead of sending the trainees to Chilliwak, B.C. The Ottawa idea and the Fort Smith acquisition somehow came together and the first program was delivered, under contract, using mostly cast-off equipment scrounged from a number of government departments. That was in 1968. Over time a number of pre-employment vocational courses were added and, almost unnoticed, the Centre was established. In fact, for two or three years the Territorial Government leaders in Yellowknife were unaware of the existence of this fledgling training institution. It just sort of happened.

Throughout the 1970's, the AVTC continued to expand its services, especially in trades and apprenticeship training. Programs and students were accommodated in a collection of trailers and butler buildings begged, borrowed and stolen from wherever possible. Just recently we have started on a long-range plan to replace these with more permanent structures. During most of this time there was a general acceptance, in government circles at least, of the idea of one centralized location for most training programs. Adults from all parts of the N.W.T. were expected to travel to Fort Smith in order to participate in the programs offered there. Adult Centres in a number of communities offered mostly academic upgrading programs and, in a very few cases, some secretarial training.

By the late 1970's it was becoming increasingly evident that the centralized delivery approach was inadequate for the needs of a large part of the population. Students from the Western, Central and Eastern Arctic were generally unwilling to make the journey to Fort Smith. The few who did frequently met with failure and frustration due to the distance from home and very unfamiliar surroundings. Concerns were raised, especially by residents of the Eastern Arctic. In fact, an analysis of enrolment of Baffin Region residents during the 1977-1982 period indicated that an average of five to nine percent of the AVTC students were from the Baffin Region even though the Baffin has 18% of the overall N.W.T. population. In addition, an analysis of student success rates carried out by AVTC staff indicated that only 27% of enrolled Baffin residents were successfully completing their courses.

Thebacha College

The growing recognition that the adult training strategy needed reassessment was accompanied by increasing public pressure for greater accountability in the K-12 program. These concerns and the increasing move toward a greater level of public involvement in education generally led to the formation of the Legislative Assembly's Special Committee on Education in 1980. Composed of five M.L.A.'s from across the N.W.T., the Committee and its staff spent two years examining the education systems of the N.W.T. The study included extensive research as well as public submissions and hearings.

Their final report, entitled *Learning: Tradition and Change in the Northwest Territories*, was submitted in March of 1982. It contained forty-nine recommendations. Included were recommendations for the creation of an Arctic College system. The Committee envisaged a decentralized College System with campuses throughout the N.W.T. The system was to be established through legislation and was to operate at arms length from Government. Governance would be through an independent Board of Governors made up of N.W.T. citizens.

Even while the Special Committee was still carrying out its research, development regarding the establishment of a college system continued. The Executive Council of the Territorial Government, having decided to establish the college through policy, began by declaring AVTC a college in May of 1981. In the five years since then a number of things have happened in fairly rapid succession. It seems as though we are undergoing change on almost a daily basis — and that is very exciting.

In 1981, in addition to AVTC being declared a college, policy was also approved which supported decentralization of the delivery system through the creation of satellite campuses. Later in the year, the college was named "Thebacha College" and the Deputy Minister of Education was directed to appoint a Board of Governors for the College. As an interesting aside, the name "Thebacha" is a Chipewyan word meaning "below the rapids" and as such is very suitable for a place like Fort Smith. However, it is perhaps an indication that the full implications of a decentralized system were still not very clearly understood. The same name was not very appropriate for a college that was also to be located in, say, Inuvik, or Cambridge Bay or Frobisher Bay.

In early 1982 the first members of the Board of Governors were appointed. All regions of the Northwest Territories were represented on the Board whose members were charged with the responsibility of giving advice to the Minister of Education and the College Administration. From the beginning they took their responsibilities seriously and, despite many difficulties and frustrations, they took a firm stand on the careful planning that was so clearly needed at this critical stage. As a first step, a major strategic plan was commissioned. This was completed in 1983 and presented to the Government's Executive Council.

Arctic College

In 1984 the Executive Council gave approval to the mandate of the college as established in the Strategic Plan. That mandate is the delivery of adult education and training programs throughout the Northwest Territories. Specifically, areas of program responsibility include:

- Technical & vocational programs
- Compensatory or upgrading programs
- Adult and continuing education in vocational, avocational and liberal education courses.
- General education courses
- Initial years of university programs

To deliver these programs, the College should utilize techniques which will permit program delivery from facilities such as campuses and program centres, but which are sufficiently flexible to allow programs to be delivered at the community level. Decentralization is a key element of the College's mandate. Clearly, there needs to be a high priority placed on the utilization of more sophisticated distance education techniques such as those discussed elsewhere in this volume.

At this time, as well as receiving approval of the College's mandate, the name of the College was changed to "Arctic College" and approval was given to draft legislation which would define its role and authority. Another important step in 1984 was the appointment of a Vice President to direct the development of what was later named "Iqaluit Campus" in Frobisher Bay. Mark Cleveland writes about his work in the article which follows this one. This was the second campus of Arctic College, the one in Fort Smith becoming "Thebacha Campus". Plans are in the works for a third campus to be brought on stream in Inuvik by the end of 1986.

The Future

A key element in the long term development of Arctic College is the legislation, the Arctic College Act, which we hope will be passed in the fall of 1986. This will establish the College as a corporate body and will delegate operational rather than advisory responsibility to the Board of Governors. It will clearly establish the role of the Minister in the provision of overall direction and control of Arctic College and will detail the authority and responsibilities of the Board of Governors. A funding mechanism for the College will also be established. Under the provisions of the legislation, some aspects of Arctic College activity are expected to remain unchanged. For example, Arctic College staff will continue to be members of the Public Service and the ultimate authority of the Minister will remain paramount.

Currently we are putting together a Development Plan that will chart the course of the College over the next few years. This will take account of the need to continue moving toward a more decentralized system but will also recognize that the speed and extent of any future development will be subject to the same fiscal restraints that we are all facing these days. Hence the need to take an orderly and planned approach to Arctic College growth. We are still young and I firmly believe that we have a great opportunity to create an institution that will be flexible and able to adapt to the rapidly changing needs of Northern Society.

This summer, the head office of Arctic College will be established in Yellowknife. This office will be responsible for the overall management of the college system and will not be directly involved in program delivery. Actual program delivery will be through a combination of regional campuses, smaller program centres and community-based facilities. The campuses, located in Frobisher Bay, Fort Smith and most likely, Inuvik, will offer programs that require some kind of campus infrastructure such as specialized facilities and residences. They will also support the activities of the program centres.

These program centres will be designed to respond more rapidly than a traditional campus to the changing needs of the immediate area and will probably have only a very small permanent staff. Finally, the most flexible part of our operation will continue to be the courses offered at the community level. These programs will, for the most part, be portable with the locations dictated only by demand and the availability of a suitable facility.

Conclusion

Arctic College reflects an innovative concept in post-secondary education. Emphasizing a decentralized program delivery system, within a Territorial framework, the College has been established to address the diverse training requirements of all N.W.T. residents. While Arctic College is a new organization, its structure and mandate reflect the experience of over twenty years of adult education and training. This experience has shown the importance of providing quality programs and services which are flexible and responsive.

Many difficulties — no, challenges — lie ahead. Many more will always be with us, certainly in the foreseeable future. Our "community" is the largest, by far, in the country. A million and a third square miles. The population of that community is one of the smallest in the country and the needs of that population for education and training to help them cope with the many rapid changes taking place around them are among the greatest you will find anywhere. The Board of Governors will be expected to take on greater responsibility and control. But they must do so through attendance at only four meetings a year. Each meeting costs upwards of $20,000 and takes the members away from their homes for at least a week. They will be seeking ways to overcome the barriers of distance, time and cost and still be effective. We have already found that conference calls, in the North at any rate, are not the answer. But I am anticipating that that will probably turn out to be one of the smaller challenges that the Board will have to deal with over the next two or three years. It will be a time of intensive learning for all of us — and an exciting time also.

I think we can learn a lot from ACUNS and I am looking forward to exploring ways of establishing or improving relationships between our two groups. I have a few thoughts — and that's about all they are — on northern research and on how we might be of mutual assistance. There is a tremendous body of knowledge about the North, a fact that I think we sometimes fail to recognize. When I think of the collective northern wisdom of a group such as the ACUNS Council, it makes me think that those of us who live and work in the North are missing some golden opportunities. I hope that the workshop will give us a chance to rectify that and also to look at what we have, small though it may be, to offer in return.

Sources

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Thebacha College Board of Governors. Thebacha College Strategic Plan, Yellowknife: Resources Management Consultants Ltd., 1983.

Legislative Assembly of the N.W.T. An Act to Establish the Arctic College, Yellowknife: 1986 (untabled draft).

Some other items that may be of interest:

Lidster, E.L.R. Some Aspects of Community Adult Education in the Northwest Territories of Canada — 1967-1974, Yellowknife: N.W.T. Department of Education, 1974.

Koenig, D.M. Northern Peoples & Higher Education, Ottawa: Association of Universities and Colleges of Canada, 1975.

The Arctic College's calendar is a valuable source of information as is its newsletter Dialogue.

Note

The published results of the Workshop focussing on Arctic College appear in this Section of the volume. ACUNS, and others, are following up on various points. (ed).

ARCTIC COLLEGE: THE DEVELOPMENT OF A TERRITORIAL COLLEGE SYSTEM

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I. Introduction

Purpose

During May of 1981 the Executive Council of the Government of the N.W.T. approved a policy which established the Adult Vocational Training Centre, located at Fort Smith, as a College (see preceding article by Stapleton). In doing so, the Executive Council approved the principle of a college system for the Northwest Territories. Since this landmark decision, a number of actions have refined this policy and have caused the creation of a second campus of the college system located at Frobisher Bay.

In this paper, the development of a college system in the N.W.T. will be examined. First, I will review the Arctic College concept. Second, previous government training strategies will be identified. Third, political actions which have resulted in the advancement of the Arctic College concept will be discussed. Finally I would like to touch briefly on the issues now facing the college system.

II. The Arctic College concept

The proposal for the creation of an Arctic College system was presented by the Northwest Territories' Legislative Assembly Special Committee on Education. Formed in 1980 and composed of five M.L.A.s, the committee and its staff spent two years examining the education systems of the N.W.T. The study included extensive research as well as public submissions and hearings.

Their final report titled, *Learning: Tradition and Change in the Northwest Territories* was submitted in March of 1982. It contained forty-nine (49) recommendations. Included were recommendations which proposed the creation of an Arctic College system.

The committee envisaged a decentralized College System with campuses throughout the N.W.T. The system was to be established through legislation and was to operate at "Arms Length" from the Government. The proposal was backed by draft legislation indicating practical applications of the committee's proposals.

Since the submission of the Special Committee on Education's report, considerable analysis and assessment of its recommendations have been carried out. While the form and mandate of the Arctic College, as proposed by the Special Committee, have been altered somewhat, specific policy decisions have been made by the Executive Council of the Government of the N.W.T. to implement the Committee's thoughts and create the Arctic College.

The Executive Council has established a mandate for the Arctic College through policy decisions. While general in nature, it gives the authority for instructional delivery in the following areas: trades theory courses, pre-employment courses, university transfer courses, cultural programs, academic and preparatory programs and general interest courses.

Currently two campuses have been established, these are located in Fort Smith and Frobisher Bay.

In addition, specific emphasis has been placed on the delivery of college programming through distance education methods as well as on an extension basis.

Currently the college is directed by a Board of Governors. Appointed by the Minister of Education, the Board provides policy direction for the President. As the Board is currently a matter of Territorial policy and as the College remains, at this time, a program of the Government of the N.W.T., the degree of Board influence is generally limited to the establishment of operational policy. The approval of legislation is expected to more explicitly detail powers of the Board of Governors.

Close cooperation between the Minister's staff, particularly the Assistant Deputy Minister of Advanced Education, the senior college administration and the Board of Governors has been effective in determining the developmental priorities of the college system.

III. Historical Perspective: Factors Influencing the Development of the Arctic College

By recommending a decentralized delivery system, the Arctic College proposal marked a significant change to the adult training strategy for the N.W.T. While community adult education had, historically, been community based, adult and college training was, for the most part, delivered through central institutions. To assess the training strategies which served the residents of the N.W.T. during the past fifteen years one must look at both Federal and Territorial programs.

Federal Government — Training Strategies

While acknowledging the establishment and mandate of the N.W.T. Department of Education and providing the funding for its programs, the Federal Government, or more specifically, the Department of Indian Affairs and Northern Development (DIAND), maintained an active role in providing native northerners with avenues to southern college programs. Throughout the 1970's, the Vocational Training section of DIAND provided opportunity and support in a wide variety of training fields. The Vocational Training Section offered counselling services, transportation and accommodation assistance as well as arrangements for training allowances. For the most part, training was provided in southern institutions.

Over the past three years the activities of this section have been reduced.

Government of the N.W.T. — Training Strategies

The Northwest Territories Government has, during the past fifteen years, promoted two distinct programs to assist northerners to attend post secondary education. The first program included student financial assistance in the form of grants, loans and bursaries. Under the program guidelines northerners were able to secure financial assistance to attend post secondary programs throughout Canada. The program was supported by a counselling office located in Edmonton (Alberta). While providing financial assistance, the program had limited success in encouraging native northerners to participate in southern college and university programs. Poor student preparation and the remote nature of the counselling officer were two factors which limited the program's success.

It should be noted that this program was revised in 1982 and still remains available for qualifying northerners who wish to seek post secondary education in the N.W.T. or elsewhere in Canada.

The second, and for the purposes of this discussion, more important effort to provide training in the north, was the creation of the Territorial training centre.

Created in 1968 and located in the town of Fort Smith, just north of the Alberta-Northwest Territories border, the Adult Vocational Training Centre (AVTC) initially hosted a Heavy Equipment: Operator training program. However, the quantity of programs offered expanded steadily throughout the 1970's. Vocational programs in the fields of mechanics, carpentry and trades theory were added. Teacher Education, Certified Nursing Assistant, secretarial and academic programs were also included. By 1976 student enrollment had reached 194. Enrollment continued to rise to 308 students by 1980.

Although the Teacher Education program had been initiated in 1968, it was not until the mid-1970's that the focus of programming began to shift away from vocational skills training. The implementation of the Renewable Resources Technology Program (1978) marked a shift to increased emphasis on diploma programs. This trend continued with the development of the Social Services and Public and Business Administration Programs in 1982.

As AVTC approached college status, there was increasing public agitation for an assessment of the effectiveness of the centralized training model. Concerns were voiced, particularly by residents of the Eastern Arctic, that the services of AVTC were not accessible to the majority of Territorial residents. Indeed an analysis of enrollment of Baffin Region residents during the 1977-1982 period indicated that an average of five to nine percent of the AVTC students were from the Baffin Region. (Residents of the Baffin Region compose 18% of the overall N.W.T. population). In addition, an analysis of student success rates carried out by AVTC staff indicated that only 27% of enrolled Baffin residents were successfully completing their courses. (Enrollment figures for residents of the Keewatin and Kitikmeot regions for the same period were comparable although student success rates were somewhat higher).

Education Decision Making

The growing recognition that the adult training strategy needed reassessment was matched by the increasing public pressures regarding the K-12 program. The passage of the *Northwest Territories Education Ordinance* in 1977 had formalized a structure through which residents could, at the community level, actively influence the delivery of the education program. In some areas of the N.W.T. education authority members soon felt that additional responsibilities and power were required to effectively influence education policy and programming. This growing public awareness of the education system and the program it offered led to the formation of the Legislative Assembly's Special Committee on Education in 1980.

While the Special Committee was carrying out its research, development regarding the establishment of a college system continued. The Executive Council of the Northwest Territories Government, having decided to establish the college through policy, began by declaring AVTC a college in May of 1981. Other actions followed. These included:

1. May 1981 In addition to declaring AVTC a College, the principle of a core campus at Fort Smith with other future satellite campuses was approved.
2. August 1981 The Minister of Education was directed by the Executive Council to appoint a Board of Governors for the College.
3. October 1981 The name "Thebacha College" was approved.
4. February 1982 The members of the Board of Governors were appointed.
5. March 1982 The Special Committee on Education's final report was tabled.
6. December 1982 A second campus of the college system was declared (Frobisher Bay) by the Executive Council.
7. May 1983 A strategic planning exercise was authorized for Thebacha College by the Executive Council.
8. August 1983 The Task Force on Implementation of the Special Committee's Recommendations supported the creation of a diversified college system.
9. September 1983 The strategic planning study was completed and submitted. Multiple campuses and distance learning were encouraged in the report.
10. April 1984 The training services of the Government of the N.W.T. were amalgamated within the Department of Education.
11. May 1984 Approval by the Executive Council was given for the Department of Education to bring forward policy on the development of a college system.

12. August 1984 The Executive Council gave approval to the mandate of the College as established in the Strategic Plan. The name of the College was changed to "Arctic College". Approval was given to draft legislation which would define the College's role(s) and authority.
13. October 1984 A Vice-President was appointed to direct the development of the Frobisher Bay Campus.

The Territory-wide trends to increase the public accountability of the education system have been major factors in the continued development of the College. The aggressive stance of the current Minister of Education, the Honourable Dennis Patterson, has assisted in the continuing definition of public participation and authority in the College, K-12 and community adult education programs.

IV. Creation of the Frobisher Bay Campus — An Illustration of Direction

The Frobisher Bay Campus of the Arctic College provides an illustration of the direction of the future growth of the post secondary education and training system in the Northwest Territories. Located in the largest Eastern Arctic community the campus is responsible for the development and delivery of post secondary programs in locations throughout the Baffin and Keewatin regions of the N.W.T.

Historically, residents of the Eastern Arctic have had limited access to post secondary education opportunities. Few courses were offered locally and students travelling to southern institutions or to the original campus located in Fort Smith, Western N.W.T. experienced limited success. To address this situation the Frobisher Bay Campus was established in 1984. Serving twenty one communities with a combined adult population of 8,200 the campus delivers both campus and extension programs.

To expand college programming to all areas of the Eastern Arctic the Board of Governors of Arctic College approved the Frobisher Bay Campus Development Plan. The plan identifies eight objectives to guide and measure campus development during the initial, five year, operating period. The strategic objectives are designed to reflect the aims and mandate of the Arctic College while recognizing the unique education and training needs in the eastern regions of the N.W.T. The eight objectives are:

1. Increase awareness of Arctic College programs and services.
2. Maintain a proactive approach to campus programming and services.
3. Increase programming and enrollments.
4. Institute student recruitment policies and procedures which recognize the strengths and goals of individual applicants.
5. Establish program support and management systems that are responsive to campus needs.
6. Establish facilities to meet the needs of campus operations.
7. Coordinate campus services with the activities of other sub-systems involved in the Eastern Arctic, with adult training and education.
8. Establish program credibility within the N.W.T. and with other educational institutions in other areas of Canada.

In support of these objectives the Board of Governors established a series of strategies. A schedule for the implementation of each strategy organizes the activities of the development period. In addition, costings for each strategy are incorporated into the budget of the campus.

Program offerings

The Board of Governors has proposed that a proactive approach be taken to the determination of campus programs and services. An aggressive needs assessment process is combined with courses in compensatory, academic, technological and trades fields. Both certificate and diploma level courses are to be offered. In addition, program delivery systems will be structured to encourage both full and part-time participation in campus offerings.

Initially, the expansion of extension programs in all regions of the Eastern Arctic is seen as a priority. It is expected that extension programs will provide needed training at the community level and will develop an awareness of the variety of services offered by the Frobisher Bay Campus. Distance Education technologies will be linked closely with the extension service. The determination of appropriate programming for use with distance education technologies is expected to occur in conjunction with the activities of other campuses of the Arctic College.

Concurrent with the increase in extension services, the design and implementation of campus based services will be undertaken. Modular course scheduling and flexible registration and enrollment procedures are to be established to stimulate the view of the Frobisher Bay Campus as an accessible education institution.

Organizational structure

The organization of the Frobisher Bay Campus is structured to reflect the organizational principles found throughout the college system. The organization of program departments, student support services and management systems parallel those established for the Thebacha Campus.

It is expected that the infrastructure of the Frobisher Bay Campus will develop incrementally during the initial years of operation. The campus structure is to be divided into five organizational sections. These will include:

— Campus Direction
— Finance and Administration
— Student Services
— Extension and Distance Education
— Academic & Technological Instruction

The operation of the campus will be directed by a College Vice President. This position, along with those of the heads of the remaining four organizational divisions will compose the management team of the campus.

Development of campus facilities

At the current time limited facilities are available in Frobisher Bay for Arctic College activities. To effectively develop campus programs and services it is necessary to obtain space suited to the needs of the campus. Four types of space are required for campus development. These include: program delivery facilities; management and student support facilities; student accommodation and staff accommodation. As the growth of the campus is expected to be incremental, the acquisition of space for the campus will be phased over the entire development period. Specific space requirements will be dependent upon program approvals. At present, a number of locations in the community are being utilized for instructional purposes. However, as spaces for the college are designed and constructed a single campus location will be developed.

Financial support

The establishment of the Iqaluit Campus represents a major new initiative of Arctic College. Requirements for increases in staff, operational and capital funding are expected to increase dramatically. Since the campus' inception the operating budget has increased to over $3 million. Staffing levels have now reached twenty five permanent positions plus an equal number of contract and term employees. Growth is expected to continue as new programs and services are established.

Through the development plan the Board of Governors of the Arctic College has provided a prescription for the growth of the Frobisher Bay Campus. The establishment of strategic objectives will enable the Board, as well as its funding agencies and the general public, to measure the success of campus development. In addition, the plan confirms the direction of decentralized college system growth.

During its initial years of operation it is expected that the Campus will provide the delivery of all programs of the Arctic College in the Eastern Arctic. However, it is noted that at an appropriate future time the development of other campuses, particularly to serve the Keewatin Region, will be considered.

Working closely with other agencies and organizations interested and involved in the field of adult learning, the staff of the Frobisher Bay Campus will assist in the establishment of an effective adult learning system. This system will provide residents with opportunities for training and education thereby enabling them to benefit from the rapidly changing social, economic and political conditions in the Eastern Arctic.

V. Continuing developmental issues

While the groundwork to establish a N.W.T. College system has been established, a number of issues remain to be addressed. During the next several years decisions will be made which will affect both the form and the effectiveness of the Arctic College.

From among the decisions to be made, several key issues can be identified. Decisions in these areas will provide the framework for operational activities. Three decision-making bodies will be involved in the resolution of these key issues.

N.W.T. Government (Executive Council)

Level of commitment:

The primary decision faced by the legislators will be the level of commitment and priority which will be given to the Arctic College. Decisions regarding commitment will be indicated through the establishment of base funding levels; the passage of legislation which enunciates the College's mandate and authority; and the approval of increased program offerings.

Campus development:

A second issue will be the rate at which additional College campuses are approved and funded.

Arctic College Board of Governors

Type and priority of programs:

The Board of Governors is currently faced with a number of decisions related to the types of programs which will be offered. Competition for funding from certificate and diploma courses best illustrates the issue.

Delivery format:

An emphasis on extension programming and distance education has been specified by the Board. However, commitments of funding and expertise will indicate the degree to which this delivery method will be utilized. Active pursuit of extension and distance education will indicate an interest in further decentralization of College programs.

Arctic College Administration

Development of Arctic College credibility:

A key issue facing the senior administration is the establishment of college credibility throughout the N.W.T. Decisions in this area will be indicated in several ways including the establishment of programming content and delivery which reflects the unique aspects of the Northwest Territories; development of student services to match the requirements of various regions; public relations efforts and the establishment of student registration policies which encourage participation by residents from throughout the N.W.T.

The issues listed above and the decisions which are the result will strongly influence the character of the Arctic College system. No particular priorities have been placed upon the choices to be made. However, it is suggested that all of the issues must be resolved before the Arctic College will be firmly established.

VI. Concluding remarks

The educational systems of the Northwest Territories have undergone major reformation in the past ten years. While the prime attention has, historically, been given to the K-12 program, the growing importance of adult training has served to alter the focus of the public and legislators to include post-secondary training. The concept of the Arctic College has evolved as a direct result of the increased attention on the adult training services.

The characteristics of the concept recognize the unique and complex factors which affect the delivery of college programs in the N.W.T. Further, the development of the Arctic College system provides an opportunity for northerners to become directly involved in the governance of the College system by which they are served.

The Arctic College is in its infancy. Decisions related to its final structure and purpose have yet to be made. Nevertheless, the first critical steps have occurred. The establishment of College campuses in the eastern and western portions of the N.W.T., the approvals which have been given for the development of supporting legislation and the actions of the Board of Governors will lead the way in the delivery of College programs in the Northwest Territories.

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ARCTIC CO-OPERATIVES LIMITED — ITS ROLE IN NORTHERN EDUCATION

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A few words to explain the Arctic Co-operatives.

The Co-operative was introduced to us in the Northern settlements on the initiative of the federal Government in the sixties to help us control our own destiny. At that time very few of the Inuit or Dene had any formal schooling. It was obvious that education in the new ways was to be the first preoccupation. In a few years most all communities saw groups of people organizing themselves to set up their Co-operative businesses often with volunteer help from outsiders living in the community such as Government employees, missionaries or officers of the R.C.M.P.

Delegates from all the existing Co-operatives in the N.W.T. decided to form a Federation of Co-operatives to provide themselves with better services. The first objective of the organization reads as follows: "Provide marketing and purchasing services, education, staff training and co-ordination of services for its members."

Many initiatives were taken to train people, newsletters, seminars in the settlements and also prolonged sessions for selected people in southern Canada. Though most of these initiatives were beneficial they did not show a systematic approach. In 1977 the Board of Directors of the Federation requested a comprehensive Training Program for native managers. There was unanimous support from the following annual meeting directing management to place increased priority on Training. The Federation's Training Department submitted a proposal for Funding to Special ARDA, a joint Federal and Territorial program. The philosophy which guided the whole program declared a strong emphasis on the building of people as well as training competent managers. The program recognized that it is not sufficient to just teach skills. The general objective of the Management Training Program as set out in the proposal was to strive for:

1. Total human development in order to instil *self-confidence*.
2. Comprehensive social development in order to ensure *self-reliance*.
3. Secure economic development in order to guarantee *self-sufficiency*.

The more specific objective in initiating the program was very much in the minds of all the people involved: "to ensure full and meaningful participation by the Dene and Inuit in the management and control of their co-operatives through placement and training of native managers soonest and through continual education for the membership to assure control and decision making by the Boards of Directors."

When it came to goalsetting: 24 trainees would be placed over a period of three years, 6 trainees to status of full management, 10 to departmental status and increased responsibility levels for 8.

Special ARDA, the funding agency, drew up contracts with 31 Co-operatives out of the 35 at that time in the N.W.T., for participation in the program. They provided a resolution requesting the Federation to assist them in implementing their Training and Development Program for:

1. Native Management Program
2. Providing their Board with a Co-operative Education Program.

It was a difficult task to decide the kind of program needed and then even more difficult to develop it. The decision to choose a competency-based training program was based on the following requirements:

1. A good training, on-the-job, program plans and organizes the training activities around practical experiences that will provide the knowledge and skills required in the performance of the task.
2. The activities had to be broken down into steps which could be measured and evaluated.

Arctic Co-ops contracted Co-op College of Canada to get assistance from their staff to complete the competency based program.

Stage 1 had to deal with the development of the profile and to identify the skills for a manager. Eighteen competent Co-op managers and area managers spent several days brainstorming to identify skills. The result was the Training Profile for Management.

During stage 2 the training profile was exposed to a larger group of management personnel at Co-op College and at the Co-op Management level. It was felt the exposure to a larger group of professionals was needed to assure that all the basic skills were covered.

Stage 3 dealt with the development of performance standards to evaluate results.

From 1979 to 1983 a minimum of two visits was made to each participating Co-op by staff of the Training Department to explain the program, assist in selecting manager trainees and deal with local concerns. Aside from the local visits there was the on-the-job training with the Co-op Manager, there was teletraining and two seminars a year.

It took much time before most managers committed themselves to deliver the training but over a period of time most managers became very positive. Several sessions were organized for trainer managers which helped greatly to get them involved and committed.

After more than two years an increasing number of native manager trainees were taking on management responsibilities. Mostly on a day to day basis, they were doing quite well but were lacking in the more difficult management skills which necessitated a support system:

1. to provide native management with additional skills and advisory service
2. to assist in the implementation of staff training and Board Education

From 1979 to 1983 there were 49 people who participated in the Management Training Program. These people remained on the program for at least three months. At present there are 14 General Managers, 4 Department Managers and 6 Trainees.

It is difficult to give a full view of the program in a short paper but the report cited at the end provides additional information. Also the manager of our Education department was present at the ACUNS meetings with a display on Arctic Co-operatives. While running the Manager Training Program, we started a Program for training Directors and members in general. One Dene and 3 Inuit were hired and given the broad responsibility to initiate and conduct Board Education in the communities. The content of the program was determined by the expressed needs of the Board of Directors and also by the Education Officers themselves. Though much work was achieved, such as the development of a list of skills to be acquired by a Board and two manuals containing suggestions for learning activities to help the Officers in their role as Adult Educators, it became obvious that the program was too much dependent on the Education Officers. The continual travel was the main reason why the Officers resigned after more than a year. Management also realized that most Boards would wait for the Education Officers to show up and they would take on very little responsibility for their own programs.

The Education Officers have contributed much to the actual program, their presence and work in the field made the present program possible. The Boards, like the manager trainees, needed and wanted a systematic and comprehensive program. The success of the Management Training Program designed on a competency basis speeded up the decision to design a Program for directors under the same model.

The designing of the program started beginning 1981. The development of the materials and the total program happened in the same way as for the managers' programs. Directors and a group of experts met for brainstorming sessions and the final package ended up with:

1. A Board Education Profile consisting of 68 duties that a Board of Directors must perform to function effectively. The guide follows a systematic procedure for acquiring the necessary skill.
2. The Policy Book with 45 suggested policies that Boards can establish. It gives the rationale for the policy, the guidelines for writing it and reference to resource materials.

The implementation of the program was done through three-day workshops with two or three complete Boards of Directors in attendance. Through the workshops we wanted

- to introduce the materials to the Boards
- to assist the directors in establishing for themselves the needed performance standards for each duty
- to assist the Boards in planning a six month educational program
- to introduce the Co-op Policy Book.

For the most part, these objectives were met and later on a new series of Workshops was planned to help the Boards to evaluate their progress and to identify the skills they need in the performance of the more important duties.

Also a few regional meetings were held for directors dealing with common concerns and to develop specific skills towards working efficiently in a central organization and in harmony with the other Native Organizations.

So far, totally in agreement with their principles, the N.W.T. Co-operatives have been able to co-operate amongst themselves through their central organization which has prevented the disappearance of some of the local Co-ops in serious financial difficulties. Inuit, Dene and Metis find themselves working together in the same organization, represented at the 12 member Board of Directors of Arctic Co-operatives, their Federation.

The big question: *Where is the program at today?* With the drying up of the financial resources and the limited resources in the hands of the local Co-operatives it has been impossible to keep up the same momentum. Area managers, in co-operation with the local managers, are using the Management Training Program to the best of their ability. The Board of Directors of ACL set the direction and spends one day of their Board meetings in a training session, directly related to the materials under consideration at that meeting.

Some of the local Boards continue with occasional training sessions. The Policy Books are quite developed in some Co-operatives.

Hopefully I have been able to give you a glimpse of how we have developed a valuable instrument for training adapted to our own environment.

Note

The Summative Report, Management Training and Board/Member Education Program, April 1979-March 1983, available from Arctic Co-operatives, contains a great deal of information relevant to this paper. The address of the Cooperative College of Canada is 510 - 119 4th Avenue, Saskatoon, Sask. (306) 244-3600 (ed).

MANAGERIAL TRAINING IN NUNASI CORPORATION

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I am a business management officer with Nunasi Corporation in a new office that our organization has established in Yellowknife. The subject of advanced education and training is an important one to me, insofar as I have started a business-related training course through the corporation after spending some eight years as a civil servant with the Government of the Northwest Territories in Frobisher Bay.

Let me begin with a brief description of Nunasi Corporation for the benefit of those who may not be familiar with our organization. Nunasi Corporation is the business arm of the Inuit of Nunavut. Our corporation was established about 12 years ago by the Inuit Tapirisat of Canada as a major benefactor from the land claims settlement currently being negotiated by our land claims arm, the Tungavik Federation of Nunavut. The corporation will have the responsibility of investing funds that accrue out of land claims on behalf of present and future generations of Inuit. All of the Inuit in Nunavut are beneficially the owners of our corporation.

Our corporation has developed a variety of business interests in advance of the land claims monies being received. This has been quite a struggle in the absence of equity capital but, through generally positive relationships with our bankers and with government agencies, we have been able to get a few business ventures off the ground. Principally, these include:

- A Real Estate Division — We own office buildings in Frobisher Bay and Cambridge Bay and an apartment building in Inuvik.
- We own a sizable interest in the Igloo Hotel, Baker Lake.
- We have purchased the assets of Ontario Central Airways which was subsequently renamed Nunasi Central Airlines.
- We own a number of aircraft and facilities in northern Manitoba and operate a charter service out of Churchill into the Northwest Territories.
- We have successfully operated large labour pool contracts associated with Cominco at Little Cornwallis Island and with Cullaton Lake Goldmines which operated until recently near Eskimo Point.
- We made a very sizable and successful investment in Cullaton Lake during its formative years.
- A year ago, we acquired, on a joint venture basis with the Inuvialuit Development Corporation, the ownership of Northern Transportation Company, Ltd. which, as you are aware, is a very large company with the mandate of shipping goods by water into the Mackenzie, the Mackenzie Delta, Kitikmeot Region and into the Keewatin Region.

- We own a majority interest in Nunatext Publishing Limited — a publishing company based in Frobisher Bay and Ottawa which among other activities owns Nunatsiaq News.
- We are planning a number of other ventures ranging from the production and marketing of sealskin products to an involvement in the mining industry of the Northwest Territories.

As you might imagine, associated with these enterprises and with our headquarters in Ottawa and Yellowknife are a very substantial body of employees.

I regret to tell you that only a very small number of these employees are Inuit people at the present time. This is a major question that our corporation intends to address. Currently, our businesses have a total of 53 management personnel and by using very conservative projections, we foresee having a total of 100 management personnel by 1990 and as many as 185 by 1995. Our corporation has set the objective of improving the ratio of Inuit managers from its current level of 8% by an additional 5% per year over the next ten years. Having set this target, the question becomes "How are we going to achieve it?"

Nunasi Corporation has proposed to Canada Employment and Immigration a "Nunasi Careers Program". This ambitious program would essentially enable us to meet the target for Inuit managers that I noted above. It is a very expensive program and we do not disguise this reality. Including the costs of hiring and paying the wages of a dozen trainees during their course of studies, and paying the overheads associated with providing instructors, accommodation and facilities, the total annual bill approaches $680,000.00. The program would feature both classroom work associated with eventual careers in the Nunasi network of companies (in Frobisher, Rankin or Cambridge Bay) but would also include extensive work-related experience in the actual job for which the trainee is being prepared. This, to us, is the major selling point of the Nunasi Careers Program. We are not trying to impart simply a diploma or other paper qualification, we are trying to provide Inuit people with the specific skills associated with managing our companies and with a job in one of these companies following completion of the training interval.

I would like to applaud the efforts of the Government of the Northwest Territories and Arctic College to provide advanced education for Inuit people. We are confident that the programs being offered in Frobisher Bay and in other Arctic centres will contribute positively towards the development of a competent pool of Inuit people who are in a position to manage our collective destiny. However, we are not confident that these institutions of higher learning will be in a position to provide our corporation with sufficient numbers of trained individuals who are in a position to assume management responsibilities in our companies. We simply feel that if Nunasi is to get its business interests into the control of Inuit managers, we must act in addition.

We are aware that there is a great competition for funds amongst institutions of higher learning and organizations that would involve themselves in training. We are also aware that in today's world these funds are not as abundant as they need to be. However, we do not feel that it is an acceptable position to vest all of the training requirements of the Inuit into the established institutions of higher education.

The question I would like to leave with this conference is the question of how the need for Inuit management personnel should be addressed. Should the field be left to recognized and established institutions of higher learning such as Arctic College? Or, should employing organizations such as Nunasi Corporation be given the mandate and the funds to both train management personnel and take the extra step of placing these personnel in specific managerial assignments?

Certainly it is the view of our corporation that while there are areas for collaboration and co-operation, it is too simple an answer for us to vacate this important field to those involved with providing a general education to our people.

Note

A copy of *Nunasi Report* (Vol. 3, No. 1, January 1986), the newspaper of Nunasi Corporation, was distributed to all delegates at the ACUNS meetings at which Abraham Tunraluk spoke. This issue was devoted to Nunasi's training programs and is, with other issues, a very useful reference. *Nunasi Report* is published in Inuktitut and English. It is available from Nunasi's Ottawa address (ed).

THE DEVELOPMENT OF INDIAN/NATIVE STUDIES IN CANADA

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In the not-so-distant past it was actually illegal for Indian people in Canada to achieve university degrees, or to become medical doctors or lawyers, and yet remain Indians. The Indian Act could automatically strip such persons of their Indian status, an option frequently imposed by the Department of Indian Affairs:

> "Every Indian who is admitted to the degree of doctor of medicine, or to any other degree, by any university of learning, or who is admitted, in any province of Canada, to practise law, either as an advocate, a barrister, solicitor or attorney, or a notary public, or who enters holy orders, or who is licensed by a denomination of Christians as a minister of the gospel may, upon petition to the Superintendent General, ipso facto become and be enfranchised."[1]

Higher education at that time did not serve Indian people well. Indeed, the stereotype of the Indian "mighty warrior and great hunter" presumed that there was little that the Indian could contribute in the area of higher education.

By the 1950's, with the easing of the Indian Agent system and restrictions on Indian movement outside of the reserves, a few Indians began to attend universities, and mainstream society became more aware of the so-called "Indian problem." The earliest university classes on Indians, when not looking at Indians and their cultures as "artifacts", were geared towards enabling white students to study the "Indian problem." It is not surprising that these early attempts to study Indian people were unsuccessful at attracting Native people to university. Before 1969 fewer than five hundred students of Indian ancestry attended Canadian universities in any one year.[2]

The historical roots of Native Studies, therefore, lie in universities' attempts to rectify past failures by establishing programs which would accurately reflect the Native experience in Canada and attract Native people into universities. Several specific factors led to the development of Native Studies.[3] First, there was a recognition of the need to correct the distortions imposed by the neo-colonial European view of Canadian history and culture, or at least those parts in which Native people can be seen to participate. The awareness of past omissions and distortions affecting the perception of Native people derives from a philosophical and ideological shift in education in the past twenty-five years. Drawing attention to national identity including the social, economic and psychological underpinnings of that identity have prompted efforts to "Canadianize" education by reassessing the consequences of our colonial past. This process had particular significance for Indigenous people around the world because the dismantling of colonial structures and the emergence of third world nations as a political force have stimulated a re-evaluation of tribal cultures. In addition, the articulation in the late 1960's of universal human rights and attempts to defend those rights by legislation and international sanctions have had their impact on education. Recognition of the integrity of tribal cultures as defined by Indigenous peoples themselves is part of the basis of a larger movement of assuming control over their own lives. This has contributed to a readiness within the academic community to make room for a study of Indigenous populations which attempts to address Native peoples' interpretations of their own experiences.

Another factor in the development of Native Studies has been the perceived social responsibility of educational institutions. Public financing of education is, in part, rationalized on the grounds that it is a major means of providing equality of opportunity, which is held to be a basic value of a democratic society. Analysis of Canadian social structures has identified flaws in this rationale and has provided a basis for arguments that socially disadvantaged groups require improved access to educational opportunities in order to realize their rights as citizens. Thus another influence on the emergence of Native Studies has been the recognition that educational institutions ought to become more instrumental in equalizing Native opportunity for participation in society.

The first Native Studies Department in Canada was established at Trent University in 1969. The development of Native Studies at Trent reflects the interplay of the influences described in the foregoing comments. The initial program was formulated in the late 1960's, a period when criticisms of social structure and efforts to assert human rights were creating a ferment in the United States and stirring social consciousness in Canada. Given this context the program made a number of assumptions. A long range intention expressed by the designers of the program was a commitment of university resources and expertise to ameliorate social problems facing Native people, by educational means. Consequent planning briefs stressed the need to attract Native students into the program in order that they might provide leadership in solving the problems of Native communities. Efforts were made to contact and solicit advice from Native leaders. In addition to addressing Native needs, Native Studies also assumed the task of providing members of non-Native society with appreciation of the Indian reality in Canada.

It was also assumed that, as a component of an Arts and Science undergraduate faculty, Native Studies would develop as an academic discipline consistent with the established norms of the University, stimulating the intellectual growth of students and undertaking research in accord with accepted rules of academic inquiry. Since the object of study was to be Native experience, not restricted by boundaries imposed by discrete disciplinary approaches, the principle of using the tools and training available from various disciplines has been accepted from the outset. Faculty expertise in the department has regularly included backgrounds in Anthropology, History, Sociology and Psychology and professional training in education, law and social work.

A final assumption has been that Native Studies at Trent should be consistent with and a reflection of Native culture. That is, persons associated with the program, as students and instructors, should be able to discern a symmetry between Native Studies on the one hand and Native traditions and contemporary cultures on the other. The chief means employed to attain this symmetry has been to engage a majority of faculty with Native ancestry and experience in the Native community. This was viewed as important because Native people maintain a tenacious commitment to community as the vital source of this cultural identity as a people.

The development of Native Studies at Trent is illustrative of attempts to operationalize the preceding assumptions in subsequent Native Studies programs in universities across Canada. In order to provide post-secondary educational opportunities for Native students who possessed intellectual potential to succeed at university but who, for varying social, economic and cultural reasons, were not eligible for admission to university, the department created a two-year Native Studies Diploma Program in 1974. Students were admitted with Ontario Garde 12 (instead of Grade 13) or as "mature students" and provided with extensive support services including academic skill development courses, tutoring, counselling and reduced course loads. A majority of their courses were and are regular university courses which, upon successful completion of the Diploma Program, can be transferred as credits towards a degree program.

In 1975 the department established a practicum component to its course offerings whereby students could apply their classroom learning to Native communities and organizations for course credit. Field placements are available in the areas of social services, law, education, politics, business, economic development and research. This initiative pertains to the assumption that Native Studies should provide students with an understanding and involvement with the real concerns of Native people.

In an effort to reflect Native culture Trent, like all Native Studies programs, provides courses in Native languages and cultures. Similarly, the department has, since 1976, sponsored numerous cultural events including traditional feasts and ceremonies, art exhibits, Indigenous peoples theatre festivals, Elders and traditional peoples conferences and pow-wows in an effort to expose students to traditional Native culture. Indeed, some Native Studies programs view themselves as participants in the revitalization of Native culture presently occurring across Canada.

Most Native Studies Departments in Canada exist within a Faculty of Arts and, therefore, the majority of efforts have been devoted to establishing sound academic programs. Native Studies at Trent, for example, currently offers 36 courses in both ordinary and honours programs. More recently, Native Studies Departments have developed Master of Arts graduate programs (Trent, the Saskatchewan Indian Federated College and the University of Lethbridge). Research activities have also greatly expanded. Three academic journals have been established: *The Canadian Journal of Native Studies* at Brandon University; *Native Studies Review* at the University of Saskatchewan; and the recently published *Abstracts of Native Studies* at Brandon University which, like the other initiatives, will provide academics and the Native community with useful research tools and assist in the academic expansion of the discipline of Native Studies.

The Saskatchewan Indian Federated College provides a unique example of a different approach to post-secondary education for Indians. Started in May of 1976, the College grew out of a long-standing interest by Indian leaders in Saskatchewan for an Indian-controlled higher education institution, and receptivity on the part of the University of Regina. Meetings between representatives of the Federation of Saskatchewan Indians and officials of the University of Regina headed by Dr. Lloyd Barber, resulted in an agreement to establish the College. The College would operate within the academic structure of the University of Regina, yet be independent in operation. The College's Board of Governors includes representatives of Chiefs from Indian Bands across Saskatchewan.

The College initially began with an Indian Studies program leading to a Bachelor of Arts degree. As a department of the Faculty of Arts, the Indian Studies program, while interdisciplinary, would be based on the assumption that there existed in all areas unique knowledge, concepts and viewpoints. The identification of these unique aspects would constitute the foundation upon which Indian Studies would grow. Such a process involved not only academics, but equally as important, consultation with Indian Elders and Indian people involved in various areas of Indian development.

Another unique aspect of the Saskatchewan Indian Federated College is its development of various programs both within and outside of the Faculty of Arts. Among the unique programs are North America's only full degree programs with majors in Indian Languages, Literature and Linguistics and Indian Art. The College has full degree programs in Indian Education, Indian Social Work and Indian Management and Administration. Other recently developed programs include Indian Communication Arts and Indian Health Studies. In each case, programs were developed in close consultation with Indian communities and the appropriate faculty of the university.

The College was seen as a risky experiment, an effort to create a College out of virtually nothing. Some observers feared that the College would meet an early demise, or would develop academic programs of inferior quality. Today, those commentators agree that those fears have been dispelled.

Since the inception of the College in 1976, enrollment has grown from an initial 9 students to 620 students in 1986. The College has now produced over 250 graduates. Those graduates have taken courses of study which meet the same admission requirements and academic standards as the broader university. College students have generally taken at least half of their classes directly through the university. The recent approval of a Special Case Master of Arts Indian Studies degree reflects the academic advancements in the College.

A recent 10th Anniversary statement by former SIFC President Del Anaquod reflects the mood of optimism at the College:

> To our young people, ten years may seem like a long time. However, for many of us, especially our Elders, ten years is like yesterday. And in such a short time, we have come a long way.
>
> The College owes its success to many people. But none were more important than the Elders and leaders who had a dream — a dream that we could control our own college, our own destiny. Today, that dream is a reality. SIFC is unique: it is the only Indian controlled institution in Canada, offering degree programs.
>
> The struggle was not easy. Their dream went against the prevailing attitude of governments and others at the time. Nevertheless, our Elders and leaders kept on and found other people who shared their dream. Eventually, we found a home at the University of Regina. The university has provided not only moral but also financial support. For this we are thankful.
>
> One out of every four Indian students going to university in Canada attends the SIFC. Because of the College, Saskatchewan Bands have the highest per capita percentage of students attending university in Canada — we have students from over 50 Saskatchewan Bands attending SIFC.
>
> Our academic success is reflected not only in our increased retention of our students, but also in the excellence of our graduates. To date over 250 have graduated from the College. Many are now leaders in their own communities.
>
> We are one of the fastest growing colleges in North America — our enrollment increased by 19 percent this fall over last winter. We also provide instruction to another 300 students who are not formally registered full-time with the College but take our classes. This past spring, for example, we had 60 Band Welfare Administrators attend an accredited training program.
>
> In regards to our academic direction, the majority of our students are either in the Faculty of Arts, Social Work or Education. We have few students in management and administration or the sciences.
>
> The Board has set a priority to address these two areas.
>
> Towards this end, the College is in the process of enhancing our Indian Management and Administration program by adding a Business School component. It is also in the process of developing an Indian Health Careers program designed to get more of our people into the health professions. In addition, over the next few years, we hope to strengthen our Faculty of Science. Other areas where we want to become involved in the future, are Human Services (i.e. Child and Family Services), Graduate Studies, an Indian Justice Program, and programs supporting the traditional livelihoods of hunting, fishing, trapping and agriculture.
>
> However, the first step in building for the future is to pause and reflect on our past. Our 10th Anniversary provides us with the opportunity to do just that.[4]

Today, there are over fifty universities and colleges in Canada with some form of Native Studies Department, program or area of study. In addition to Native Studies Departments, numerous special academic programs are in existence. For example, the Gabriel Dumont Institute in Regina, the Treaty and Aboriginal Rights Research Centre in Winnipeg, the Native Law Centre in Saskatoon and numerous Native teacher education programs such as those at Brandon University, the University of British Columbia, the Université du Québec à Chicoutimi and McGill University (see elsewhere in this volume). Departments of Indian/Native Studies exist in nine universities in Canada. (Table 1).

Table 1
Canadian Universities With Departments of Indian/Native Studies

Alberta	Manitoba
University of Alberta University of Lethbridge	Brandon University University of Manitoba
New Brunswick	Ontario
St. Thomas University	Trent University, Peterborough & University of Sudbury
Saskatchewan	
Saskatchewan Indian Federated College (University of Regina) University of Saskatchewan	

In all of this, there are identifiable trends. There has been growing consultation and involvement of Native people in the development of Indian/Native Studies programs. There has been greater emphasis on relevance and uniqueness in the programs' development. Indian/Native Studies is expanding in its interdisciplinary nature. As Indian/Native Studies evolves, it will go beyond the stage of rediscovering and redefining Indian life and culture to a stage in which it can challenge some of the basic assumptions of mainstream knowledge and contribute meaningfully to the development of knowledge generally.

The formation of the Canadian Indian/Native Studies Association (CINSA) in 1984 marked a major step in promoting the interests in the field nationally. The objectives of this Association are:

1. Foster the exploration, articulation and application of research and education grounded in Indian/Native philosophies and concepts.

2. Encourage and support:
    (a) the development of Indian/Native Studies in Canadian universities and colleges; and
    (b) the professional development of persons engaged in such programs.
3. Foster communication between Indian/Native Studies departments and programs in Canada through the holding of meetings, conferences and symposia.
4. Promote research and publication of Indian/Native Studies.
5. Liaise with national, regional and local educational associations and Indian/Native communities.
6. Promote the immediate and long-range concerns of Indian/Native Studies departments and programs.[5]

Since its formation, the Association held its first policy conference at Trent University in November, 1985. Out of that conference, which focused on "The Role of Universities in Self-Determination", has come a clearer plan of how the objectives of the Association can be met.

The Association is developing a working agreement with the Society for the Advancement of Native Studies, under which the Canadian Journal of Native Studies will become CINSA's official scholarly publication.

At the 1986 Learned Societies Conference, the Canadian Indian/Native Studies Association offered a program for the first time. Such activities will help Indian/Native Studies achieve recognition as a discipline equal in stature to other university disciplines.

Indian/Native Studies programs still face a number of issues. Many programs require great developmental funding. Native programs exist at various levels of development across Canada and there is potential for the development of more Indian/Native Studies Departments. Indian/Native Studies programs continue to seek the means to meet the demands of both the academic and the Native communities.

1. Department of Indian Affairs, Indian Act of 1886, Section 86.
2. McCaskill, Don and McCue, H.A. "Native Studies at Trent University". Paper presented to the XLI International Congress of Americanists, Mexico City, 1974, p. 1.
3. Castellano, M.J. and McCaskill, Don, "Native Studies: An Emerging Discipline". Paper presented to the Learned Societies Conference, Saskatoon, 1979, pp. 3-5.
4. Saskatchewan Indian Federated College Annual Report, 1984-85.
5. Canadian Indian Native Studies Association, General Bylaws.

Note

This paper was developed from an address by Blair Stonechild at the ACUNS meetings in Yellowknife. (ed).

TEACHER EDUCATION IN THE NORTH

TEACHER EDUCATION IN THE NORTH

Jack Cram, Chairman of the Workshop at the ACUNS meetings in Yellowknife upon which this Section is based, died soon after completing his contributions to it. As is apparent from the contributions herein alone, Professor Cram was a tower of strength in the drive to improve teacher education in northern Canada. He is greatly missed. We are grateful to Alan Cooke for the Appreciation which leads off this Section. This piece is not simply a tribute to a fine person and scholar (although it is certainly that), it is, as Jack would have preferred, also a valuable contribution to the Section. It contributes by providing an entrée to the work of a lifetime.

Teacher Education is one of the principal vehicles for self improvement and community development in Canada's North today. It is a vital field in which changes are occurring very rapidly. These changes are dealt with explicity and implicitly in the following articles.

Jack Cram and David Wilman (Co-Chairs of the Workshop) provide a useful overview of the field in their Workshop Discussion. The papers then provide, in sequence, views of teacher education in the circumpolar north, across northern Canada, in the eastern and then western portions of the Territories, in Northern Québec, and finally, in Newfoundland-Labrador.

ACUNS hopes that these perspectives will be valuable for those students and educators, struggling with teacher education in remote areas in Canada and abroad.

JOHN MURRAY CRAM, 1926-1986

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Jack Cram is author or joint-author of three papers in these proceedings of the Conference on Higher Education and Research in the North, a conference the Association of Canadian Universities of Northern Studies (ACUNS) held in Yellowknife during April 1986. Participants in its Workshop on Teacher Education, of which Jack was co-chairman, will remember his introduction to it, a lively and humorous review of the education of teachers in the entire circumpolar north, remarks based on his own recent travels in northern Canada, Greenland, Scandinavia, and the Soviet Union. Jack finished work on his contributions to these proceedings just before returning to Frobisher Bay to help wind up the summer school of the Eastern Arctic Teacher Education Program of which he had been program director from its inception in 1981. He died there in his sleep on 18 July 1986, his work in Frobisher Bay wonderfully accomplished.

Jack was born in Saskatchewan in 1926 of fourth- and fifth-generation Canadian parents whose roots were Scottish. His father had homesteaded in Saskatchewan before World War I and returned there in 1919 to marry Jack's mother, a school teacher. The drought of the 1930s "dried out" the Crams, who moved to a small town in Alberta, where Jack attended local schools. He entered the University of Alberta, Edmonton, in 1946 to study engineering, but he switched his field of study in 1947 to English. After graduation, he qualified as a school teacher. During summers, 1947 to 1951, he worked as miner, prospector, truck driver, and cat-skinner at various mining camps in the Northwest Territories.

In 1951, he married Barbara McGregor, a teacher from Edmonton. During the next decade, they worked in educational settings that included schools at airforce bases in Canada and the United Kingdom, a borstal school, and adult-education programs in England. Between 1958 and 1961, based in southern England, they salvaged and restored an old Dutch sailing barge on which they lived in winter and with which they indulged in summer a passion for sailing rarely found in persons from the Prairies.

In 1961, the Crams returned from England to settle in Montreal. Here Jack worked as guidance counsellor and teacher in a large new high school until 1965, when he joined McGill University's new Department of Counsellor Education. In 1967, the family moved to British Columbia for two years. There Jack finished his Ed.D. and Barbara completed an M.A. in education. Jack's thesis dealt with miners' perceptions of their work in remote areas of northern Canada, a subject that had interested him during his undergraduate years.

On return from British Columbia to Montreal in 1969, Jack realized that the educational authorities of both the Province of Quebec and the Northwest Territories were showing new interest in the quality of schools in their remote areas. With colleagues at McGill, he developed testing programs and research projects for the lower North Shore, Gaspé, and the Magdalen Islands, Quebec.

In 1972, Jack had a serious heart attack. He resumed his normal activities a year later, but recurring irregularities in the rhythm of his heartbeat eventually required a pacemaker and ever-stronger medication, conditions of life that might have made anyone else a valetudinarian. Jack laughed and joked about his debility in a way that encouraged others to forget it as much as he seemed to forget it himself. He was the first to encourage any suggestion of celebration and the life of every party he ever attended — and they were neither few nor small.

In 1975-76, Jack helped to establish what is now called the Kativik-McGill Teacher Training Program among the Inuit of northern Quebec. All previous attempts to train Inuit to become teachers had brought students to southern campuses where, for a variety of good reasons, they always failed. The great innovation in the Kativik-McGill program was to take McGill's teacher-training courses to the settlements of northern Quebec. There the Inuit themselves helped to elaborate a new system of education in which professionally trained and certified Inuit teachers now instruct the primary grades in their own language. Some 30 northern Quebec Inuit have now qualified as teachers in this way, and about 75 others are now registered in the program. Inuit communities control the choice of teachers and the cultural content of courses offered by the Kativik School Board. The implications for the future of northern Canada of this successful program to train Native teachers are only now beginning to be realized.

Jack rose through the ranks to become full professor of education at McGill in 1977. In 1980, he became also director of McGill's Centre for Northern Studies and Research. Jack had spent a sabbatical year, 1977-78, at the Scott Polar Research Institute, University of Cambridge, and he now tried to implement at McGill lessons he had learned in Cambridge about the operation of a successful polar research institute. He tried in vain.

McGill had never given its Centre for Northern Studies and Research a base budget. When, in 1982, the Province of Quebec ceased to support the northern studies centres in its universities, McGill not only refused to continue modest support of its own centre for long, McGill refused to let Jack apply elsewhere for financial support he had reason to believe was waiting for his application. In 1983, the McGill University Library expropriated the Northern Studies Library from the centre that had created it. From that moment, the Centre for Northern Studies and Research was doomed.

Ill as he was, Jack had fought with dignity and courage a battle impossible to win with university bureaucracy. He did not repine. Returning to his work in the Faculty of Education, he was instrumental in securing from the Donner Canadian Foundation in 1984 a grant of $80,000 for the training of Inuit school commissioners in the Baffin Region, Northwest Territories. This grant continued the Donner Foundation's interest in the Eastern Arctic Teacher Education Program, Frobisher Bay, to which, at Jack's proposal and through McGill, the foundation had contributed $400,000 between 1981 and 1985.

Forty-nine Inuit from the Canadian Eastern Arctic have now earned their teaching credentials by taking courses offered through the Eastern Arctic Teacher Education Program in Frobisher Bay by McGill's Native and Northern Education Program, of which Jack was founder and director, and about 150 others are now working toward their certification as teachers. These are big numbers for a field-based training program in an Arctic environment and they are a satisfaction to everyone concerned with them. In June 1986, Jack disregarded medical advice to attend in Frobisher Bay a ceremony in which two of the first three Inuit to earn B.Ed. degrees from McGill received their diplomas.

David Wilman, principal of the Eastern Arctic Teacher Education Program, worked closely with Jack to achieve these successes. Wilman recounts with glee his favourite among many stories about Jack. In 1984, Wilman had requested an evaluation of the education of teachers in the Northwest Territories. The evaluator, passing through Montreal to talk with Jack about his own and McGill's rather vaguely defined roles in the work at Frobisher Bay, claimed to be puzzled. "As for myself," Jack explained in summary, "my role is easy to define. I am their pimp!"

This anecdote epitomizes Jack nicely. Utterly without pretension whatever the company, he had a fine earthy sense of humour and a narrative gift for telling stories with memorable punch lines his friends will never forget. A devoted family man with four daughters and a son of his own, he was a paternal friend to countless students, Native and White, who turned to him for advice and comfort when they needed it and for a laugh and good company when they did not.

Jack belonged to many professional and other associations. He was a member of ACUNS's education committee, 1978-81, and its chairman, 1979-81. He was McGill's representative to ACUNS's council, 1980-84, and a member of ACUNS's board of directors, 1981-83.

Members of the Faculty of Education at McGill have advanced a proposal to name the building the faculty occupies after their distinguished colleague, but there is no word on this motion as this text goes to press. Readers may wish to contribute to the Jack Cram Scholarship Fund, which McGill has established for Inuit students attending the university. Cheques for it, made out to McGill University, should be sent to Ms Susann Collin, Northern and Native Education Program, Faculty of Education, 3700 McTavish Street, Montréal H3A 1Y2.

Note

We are most grateful to Dr. Cooke for this contribution to the volume. The following is a selection of Jack Cram's publications (ed).

Publications and Major Unpublished Reports:

Cram, J.M. (1966, September). Student self-prediction as an aid to guidance. Canadian Education and Research Digest, 166-172.

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Cram, J.M. (1972, April). Differential needs satisfactions of mine workers in northern Canada. Canadian Journal of Behavioral Science, 135-141. (reprinted in Berry, J.W., and Wilde, G.J.S. (1972). Social Psychology: The Canadian Context. Toronto: McClelland and Stewart, 354-).

Cram, J.M. (1973). Differential needs satisfaction of teachers in Arctic Canada. Report to Task Force on Education: Man in the North Project. Montreal: Arctic Institute of North America.

Cram, J.M. (1974, January). And all the little sheep said "B.A.! B.A.! B.A.!" The School Guidance Worker, 16-20.

Cram, J.M. (1976). Magdalen Islands summer learning centre. Report to Ministère de l'Education du Québec and Regional School Board of Gaspesia.

Cram, J.M. (1977). First Quebec-Labrador Caribou conference: Schefferville, P.Q. Montreal: McGill Centre for Northern Studies and Research (occassional paper). Chairman's remarks.

Cram, J.M. (1978 January). Some bright spots in the James Bay Agreement. (Note). Polar Record, 118.

Cram, J.M. (1978, October). Training Inuit teachers in northern Quebec. British Journal of Teacher Education, 203-209.

Cram, J.M. (1978, October). Specific occupations created by the James Bay Agreement. Taqralik, 10-5. (Published in Inuktitut and English.)

Cram, J.M. (1978, September). Northern teachers for northern schools: The Greenland experience. Polar Record, 209-216.

Cram, J.M. (1981, November 9). Inuit Teacher Training in Arctic Quebec (paper). North American Association of Summer Schools, Montreal.

Cram, J.M. (1981, November 13). Native language mastery: An absolute necessity. Winnipeg: National Conference on Multicultural Education.

Cram, J.M. (1981, December 2). Northern Native Teacher Training. Report and Recommendation for Resource Staff, Special Committee on Education, Legislative Assembly, Northwest Territories.

A COMPARISON OF CANADIAN PROGRAMS WITH SUGGESTIONS FOR RESEARCH

NORTHERN TEACHER TRAINING, — WORKSHOP DISCUSSION

Jack Cram
McGill University (Chair)

David Wilman
EATEP (Co-Chair)

For addresses see other articles

Following the semi-formal presentation of the chair and co-chair, discussion was opened with the request that before the end of the session, general statements should be turned into a series of specific research needs to be presented to both northern training institutions and southern universities.

What follows is an attempted synthesis of the discussions which went on during, and in some cases, after the Workshop.

To complement the detailed description of the Eastern Arctic Teacher Education Program (EATEP) given by the co-chair, the director of the Western Arctic Teacher Education Program, Fort Smith, gave a thorough description of the sixteen year history of her program, its successes and problems. Most revealing to the southern observer were the startling differences between the Eastern and Western programs. Later contributors added to these regional contrasts and included warnings to those social scientists and others who would attempt to generalize across peoples and locations in the North. These contrasts, selected from various periods of the Workshop, are worth summarizing here if only to alert the inexperienced southern scientist to the immense heterogeneity of northern populations as exemplified in something seemingly so simple as the training of teachers.

The Western or Fort Smith program serves a half dozen or more distinct groups, different as to language, culture or both. These range from the Chipewyans in the south through Dogrib, Slavey, Hareskin and Loucheux to the Inuvialuit in the Delta and Beaufort regions. Each of these groups has its own range of knowledge, skills and values which it wishes to pass from generation to generation. Each has its unique history of exploitation by European culture and hence a unique attitude towards economic development, politics, education, schooling and teachers. Each group has its own language (or dialect); some are weak, some are strong. Among the Inuvialuit, as reported by Mary Lyons, (see elsewhere in this volume) most children have English as their first language with Inuvialuktun a poor second when they enter school. Large numbers of Slavey children, however, are said to enter school fluently unilingual in their own language. Obviously teachers trained to work in these groups must have quite different sorts of language training to cope with the requirement that all children shall be bilingual on completion of elementary school. The "super-teacher" in the Western Arctic must not only be fluent in the native language but be thoroughly versed in second language transition methods, either English/Native Language or Native Language/English.

It was revealed that a design team, commissioned by the Minister of Education, is in the final stages of a revised Western Arctic Teacher Education Program which, it is hoped, will improve its capability to deliver differential programs of teacher training for teachers serving each language and culture group in the Mackenzie Valley.

Contrasting sharply to the Western dilemma is that of the Eastern Arctic Teacher Education Program in Frobisher Bay, described in detail by David Wilman in his opening remarks and in the paper elsewhere in this volume. The first contrast is in the distribution of population in the two regions. 85% or more of the population of the Eastern Arctic is Inuit. This fact, coupled with the recent assumption of control over schools by the Inuit, particularly in the Baffin region, makes the educational climate increasingly aimed at Inuit knowledge, skills, values and aspirations. This homogeneity is not only different from, but totally alien to, the Western situation.

Following from the first contrast, is the second, that is, that the clientele of EATEP is purely Inuit, sharing a common language with four or five mutually comprehensible dialects, and a standard orthography in both syllabics and Roman script. Except for some idiosyncratic instances in the Central Arctic, Inuit education authorities agree that Inuktitut shall be the language of instruction in the first three years, followed by intensive English while maintaining a level of adequate Inuktitut right through secondary school. Thus the teacher training mandate is clear, first, train competent Inuit teachers who can teach in their native language. Only secondarily should these teachers concern themselves with the teaching of English. This mandate is made clearer by the fact that the great majority of children in the Baffin, Kitikmeot and Keewatin regions enter school unilingual Inuktitut.

The contrasts existing among the various regions of northern Canada were stressed rather than the comparisons.

It took a geographer, armed with a map, during the coffeebreak to point out the ultimate anomaly in comparing the Western and Eastern teacher education programs. The Western Arctic program, based in Fort

Smith, is at the head of the whole Mackenzie Valley with its extremely efficient network of road, river and air transportation, and a long history of intercommunity communication dating from the first forays of the Hudson's Bay Company into the real North. The Eastern Arctic program, based in Frobisher Bay, serves a group of some 25 to 30 widely scattered, very isolated communities, linked by not too dependable air service, and crushing airfares. Yet is is the Western Arctic program which is splintered by cultural and linguistic differences and the East which is virtually uniform throughout its vast area. There is, perhaps, an interesting hypothesis to be tested here, regarding the relationship between communication and social homogeneity. If modern communications have caused the various native groups in the Mackenzie Valley to rally around their own languages, cultures and "differences", then we have a contradiction of the so-called "global village" theory, which says that increased communication will decrease cultural differences and foster standardization across world cultures.

Following coffee, discussion was steered towards specific points to be passed on to teachers, bureaucrats and universities. One problem immediately surfaced and was unanimously accepted as serious: Ministries of Education, be they provincial or territorial, insist on planning, designing, preparing, distributing and enforcing all curriculum programs and materials. It was suggested that while this may be acceptable in urban or southern settings, where parental and bureaucratic educational aims are congruent, it simply will not do in the North. Teachers, it was stated, are surely the best ones to know what students need, and a strong case should be made for teachers and teacher training institutions to collaborate on curriculum preparation. Passing mention was made of the situation in Greenland, where local teacher committees in each community are encouraged to develop original, relevant ideas for submission to the Ministry of Education. If an idea is accepted, teachers are given paid leave periods to develop it into a full-blown curriculum unit and to incorporate it into the education system.

Because the delegates from Kativik School Board (Arctic Quebec Inuit) were in another session, the chairman described the situation where the Kativik teacher training section designs and implements all curricula for kindergarten through grade two while other sections of the Board plan, design and implement all curricula in the elementary schools. The Kativik program places great emphasis on Inuktitut, and teachers can receive their initial certification (Province of Quebec and McGill University) totally in Inuktitut, regardless of their proficiency in English or French. Full details of the Kativik School Board teacher training program can be found in the paper "Education in Northern Quebec" by Sala Padlayat and Doris Winkler, which was submitted in advance of the conference, and appears in this volume.

It was regretted that the Cree School Board of James Bay was not represented to describe its training and curriculum program, which again are very autonomous.

A second specific problem closely related to curriculum is the format and content of the teacher training programs themselves. It was strongly felt that teacher training programs should be as different as the clientele they serve, allowing stress to be put on those aspects needed in the field. Universities should be encouraged to allow that flexibility in the field necessary to train native teachers uniquely for northern schools. An invitation to suggest specific research projects in teacher training which might be mounted by or through universities was responded to with great enthusiasm. These suggestions are appended to this report.

The final word in the session was given to Naudla Arnaquq, B.Ed. 1986, of Frobisher Bay, a graduate of EATEP and holder of the third Bachelor of Education degree awarded to an Inuk from the Eastern Arctic by McGill University. We quote her entirely below:

The following topics were suggested either during or after the Teacher Training Workshop as valid research projects involving Universities, Training Colleges and Northern Schools.

I. Schools and Education
  1. The relationship between home environment and educational success.
  2. The relevance of the skills, knowledge and values associated with schools to the skill, knowledge and values associated with the native culture.
  3. The effect of different administrative styles in the school on the home/school relationship.
  4. The role of the school in preserving language and culture.
  5. The role of the school in preparing children for the world of work.

II. Teachers and Teacher Education
  1. The relationship of teaching style to learning style in the native community.
  2. The impact of basic computer skills on classroom teaching particularly in mathematics and science.
  3. The inter-relationship model among student teachers, assisting teachers, school principals and college based field supervisors.
  4. The effectiveness of the native teacher in native language programs.
  5. The effectiveness of the native teacher in second language programs.
  6. The orientation of new teachers (native or non-native) to the North.

III. Children
  1. Unique native and/or northern learning styles.
  2. The physical, psychological and intellectual development of children in native cultures.
  3. Native language acquisition and retention patterns at different age levels in native communities.
  4. The educational expectancies of native children.
  5. A comparison of "Success" as measured by native cultural and modern educational criteria.
  6. The relationship between children and elders and its effect upon the education of children.

SOME NOTES ON TEACHER TRAINING IN THE CIRCUMPOLAR REGION

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To celebrate ten years of involvement with Inuit teacher training programs in Arctic Quebec and the Eastern Arctic, I am just completing a sabbatical year looking at the state of native teacher training programs in the circumpolar world. The project actually started two years ago with visits to the Herzen Pedagogical Institute in Leningrad, USSR and to Iliniarfissuaq, the teacher training college in Nuuk, Greenland. During the current year I have visited schools and training colleges in Swedish Lappland and have visited and interviewed, in the north, 54 graduates of the Kativik/EATEP/McGill program. Gradually a feeling for the comparisons and contrasts among these various programs and settings is emerging.

To me, the most unexpected factor to emerge is the similarity rather than the difference in the histories and goals of the programs studied. The processes and methods used to attain the goals form a fascinating series of contrasts. Semushkin in 1944 in his novel, Children of the Soviet Arctic, describes the establishment in 1928 of the first Kultbaz (Culture Base) in Chukotka. These Kultbaz's were combined nursing stations, schools and social centres established by the Soviet government across the north. The descriptions of terrain, people, frustrations, successes, transportation errors, language problems and cultural clashes could have been written, image by image, by any of the dedicated (if sometimes misdirected) nurses, doctors, teachers and administrators in the Canadian Arctic in the 1950's.

In interviewing McGill Inuit graduates, I heard over and over again personal stories of forcible separation of children from parents by school authorities and of the apprehension, indeed, many times, the terror, involved in boarding school life in northern Canada in the 1950's and 60's. In one instance,

> "... the priests arrived with two canoes at our camp on Garry Lake and took all us children. They told our parents the government made them do it, and we were going to school. My mother didn't know what a school was but they said it was good. We went to school in Chesterfield Inlet for two years and never saw our parents. When I went home, my mother was very surprised. She thought I was dead."

"How very Canadian," I thought, until interviewing Sami teachers in Sweden, one of whom related how she had been taken from her father's reindeer camp to attend school, "and I didn't see my parents for two years."

Even in Greenland, where there have been formal schools since 1721 and a teacher training college since 1845, stories of children separated from parents either by consent or coercion to attend school in Denmark were common, until as recently as the 1950's.

There are many such stories centering on forced schooling, meaningless curricula and "foreign" teachers forbidden to speak the native language, all around the northern world. Fortunately, these are now, mostly, historical events rather than present conditions.

The educational goals and aspirations of northern native teachers have, I believe, been shaped by these periods of repression of native values and expression, and manipulation by the ultra-powerful, dominant cultures, be they Russian, Canadian, or Scandinavian. Two goals are paramount among today's teachers:

1. Preservation and expression of native language and culture.
2. Jobs.

Native teachers, either trained or in training, clearly see their roles as helping children become full functioning, self-identified native persons be they Indian, Inuit, Sami, Kalaalluit or one of the 19 indigenous peoples of the Soviet north, and, equally important, as helping native children become responsible, job holding citizens, each making an economic contribution to the community. This double role for the native teacher is the strongest finding of my whole study. It appears to be virtually universal among native teachers in the circumpolar world. I hope it will force both the cultural purists and the economic determinists among that ubiquitous group of non-native advisors to native groups to modify their arrogant positions in the direction of expressed native aspirations.

If the role of the native teacher is so firmly connected to language, culture and jobs, how well are northern teacher training programs training teachers for this role? Whether we like it or not, the Soviets lead the pack! Ever since Lenin's 1917 proclamation that the state must not interfere with the language of instruction chosen by parents for their children, the Soviets have encouraged elementary education in indigenous languages. To do this, they have created alphabets, books, curricula and teacher training programs in each of their 19 northern native languages.

Teacher training colleges, such as that in Anadyr dealing with Chukchi and Eskimosy candidates, have been created and have turned out competent, native speaking teachers for at least two generations. Since economic productivity and job training form part of every education program in the Soviet Union, be it in innermost Moscow or outermost Uelen, the balance between language, culture and economics is recognized and implemented, if not always voluntarily.

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*Jack Cram died soon after completing this manuscript. An appreciation of Jack and his work precedes this article.

The pride of the Soviet northern language and culture program is the Faculty of the Peoples of the Extreme North at the Herzen Pedagogical Institute in Leningrad. Here, teachers at what we would term the graduate level, come from the far northern regions of the Soviet Union for professional education in the language and culture of their home area. Among the full time staff are nineteen professors, each representing one of the indigenous languages of the Soviet north. The competence, confidence and morale of the students enrolled in the program is something our own native students should experience.

In Greenland, teacher training is done with the clear goal of replacing European teachers with Greenlandic teachers by 1995. The program is a balance between Greenlandic language and culture and the realities of European pedagogical methods and economic reality. It is often criticized by its own graduates and even its professors as being too European, indeed as too Danish. This may well be true but the teachers who emerge are most certainly Greenlandic in their outlook and aims so that both they and their students face the world as Greenlanders, not as dark skinned Danes.

Sweden, that most staid and conservative of nations, has in its northernmost region, Norbotten, a revolutionary program of re-training for its Sami and Finnish teachers. The official Swedish teacher training program as carried out in the many colleges and universities is completely standardized. It was described to me as "someone turning a crank in Stockholm and out of the colleges come teachers, qualified, certified, and ready to preserve the status quo." Little is taught to teachers that has any immediate relevance among the Sami of the north, be they reindeer herders, industrial workers or farmers. Yet the aims of native peoples everywhere are clearly identifiable among the Sami: preservation and expansion of language and culture, and provision of jobs for the young northerners.

The solution to the problem is being found, however, as a post-certification, in-service program for teachers using a method which can only be described as benign subversion. Professor Henning Johansson, of the University of Umea, armed with a generous grant from the Bernard Van Leer Foundation, has recruited some 120 teachers into a community based education program, which focuses on local language, culture, geography and economic activity. Children learn all the basic skills required in any school system and thrive in the Swedish secondary system even though their elementary curriculum is based on familiar local phenomena. There is no time for details and I shall be publishing a full account of this program, but the results are remarkable. Parents, for the first time, are involved in the schools, indigenous language has pride of place and the educational bureaucrats have swallowed their pride and given Professor Johansson Sweden's most prestigious educational award. Not all revolutionaries are so lucky. Only in Sweden, you say? Pity!

Johansson, whose languages, in order of acquisition, are Finnish, Sami, Swedish, English and French, believes that mother tongue instruction is the key to any program aimed at educating indigenous children. This idea he holds in common with the Soviets, the Greenlanders and a growing number of Canadian northern educators.

What of our Canadian northern teacher-training programs? Unfortunately, they are not all represented at this conference and so will not be reported. The grandfather of them all is, of course, the Brandon University Teacher Education Program (BUNTEP). I don't think there is a program in Canada that has not benefitted from (or, indeed pirated) the BUNTEP model of community based teacher training. It would be nice to have details of UBC's NITEP program in the Yukon or the Saskatchewan based programs in northern Saskatchewan. The Western Arctic program in Fort Smith is being redesigned and should be a world class facility. Unfortunately, details of this new Fort Smith are still under wraps. Memorial University has made a number of valorous starts in training native Labrador teachers. I hope we can get a full report of this program from Dennis Sharpe of Memorial. The McGill University/Kativik/EATEP programs continue to turn out Inuit teachers in growing numbers. However, like any educational innovation, the impact of these teachers can only be measured after a generation of children has passed through their hands. We can only pray we are doing the right things.

An in depth, comparative look at all aspects of Canadian northern teacher training is long overdue. Let us hope that this workshop and the discussions and papers to come from it, are a step in the right direction.

Note

This article was based on Jack Cram's opening remarks as Chair of the Workshop on Northern Teacher Training at the ACUNS meetings in Yellowknife. Papers on several of the programs which he mentions appear elsewhere in this volume. A selection of Dr. Cram's publications is included in the preceding appreciation (ed).

NORTHERN TEACHERS FOR NORTHERN SCHOOLS: AN INUIT TEACHER-TRAINING PROGRAM

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Background and history of the program

There are some 25,000 Inuit living in northern Canada, 16,000 in the Northwest Territories, 6,000 in Arctic Quebec, with the remainder largely in Labrador. The great majority live in modern permanent settlements thinly spread along the thousands of miles of coastline of the Arctic and sub-Arctic islands and mainland linked by regularly scheduled, if not totally dependable, air service, and by direct-mail satellite and extremely dependable telephones. With an annual live birthrate of 32.1 per thousand, compared to the Canadian average of 15.3, today's Inuit form one of the fastest growing ethnic minorities in the world (Government, Northwest Territories, 1984, p. 40). They are also becoming increasingly interested in their past, present and future as an identifiable group and in the subsequent developments which must take place in their physical, cultural, political and educational environments. In short, they are seeking some form of autonomy firmly within Canada. It is a part of the movement towards educational autonomy, specifically the training of competent, qualified Inuit teachers at certificate and degree levels, that forms the subject of this paper.

Before their contact with Europeans (Qallunaat, literally "big eyebrows", a not necessarily complimentary term used for non-Inuit, most particularly southern whites), the ancestors of the Inuit had built a life style which was highly sophisticated. Based on a technologically advanced, seasonal exploitation of land and sea wildlife, principally sea mammal and caribou, their life style was at once productive and ecologically sound. Evidence pieced together from both legends and archeological sources suggests summers of well regulated, extremely active hunting and caching, and winters spent in warm sod or snow houses, passing the time in storytelling, carving, cooking, eating, sewing, and religious ceremony (McGhee, 1978, p. 95).

Sophisticated as this culture was, however, there was no formal schooling as we know it. Although the language (Inuktitut) was virtually universal from Siberia to Greenland, it had no written form. Rather, education was a deep, socio-emotional process whereby a child acquired knowledge, skills and values from various individual "role models" as a necessary and highly respected part of season-by-season life in an extended family. Important milestones in a child's growth were not based on chronological age so much as the acquisition of specific skills such as killing a first seal or sewing a first skin boot. Both physical survival and spiritual expansion were grounded firmly in this competency-based model of differential individual maturation.

This deep, narrow, conservative circumpolar system of culture and education was interrupted by two events, one natural and one man-made:

1. The Little Ice Age (1600-1850 A.D.)
2. European Contact (1700 through to the present)

Glaciological and historical evidence suggest that Arctic climates began to cool dramatically about 1200 A.D., reaching a trough, the Little Ice Age, between 1600 and 1850 (McGhee, 1978, p. 103). Large portions of the channels, sounds, and seas from which the Inuit harvested their main resource, the whale, remained frozen year round. As a result, archeological evidence suggests that the Inuit of Canada broke up into relatively small, isolated groups in the present day Kitikmeot, Keewatin, Baffin, and Quebec-Labrador regions. These groups grew dependent more on local seasonal resources such as seals, caribou, and fish than on the previously universally exploited whale stock. Some groups fared better than others in this cold time, but periods of recurrent famine were not uncommon. It was these relatively isolated groups, each having developed its own locally adopted hunting techniques and local dialect of Inuktitut, which were first described by European explorers and whalers in the late 17th and early 18th centuries.

The story of the dramatic, almost calamitous, impact of European culture on the Inuit has often been told; perhaps best by Jenness (1964). Suffice it to say that by 1910, it has been estimated that there were fewer than 7,000 Inuit left in Canada, living in isolated, diminished, debilitated, and demoralized groups, almost totally ignored by government and commerce alike. Their ultimate extinction, either by death or assimilation, was predicted by many and encouraged by some, especially at government level. A slight revival of their fortunes recurred in the 1920s with the growth in the market for Arctic fox fur, but the collapse of the fur trade in the 1930s left the Inuit with little hope and no apparent future by 1940.

Throughout these trying periods, however, the same intimate, conservative and effective system of education prevailed. Traditional skills and the Inuktitut language thrived. Literacy in Inuktitut, based on either Roman or syllabic script, was introduced in the 19th century by missionaries. It was rapidly absorbed into the culture, taught within families, and became an almost instant traditional skill without "benefit" of formal schooling (Harper, 1983, p. 3).

Early formal education

Schooling, as different from, or indeed, as opposed to, traditional Inuit education, was first introduced by the Canadian government along with family allowances, and much needed and appreciated health care in the late 1940s. The few existing church-mission schools were absorbed, and free, quasi-compulsory, elementary education was offered in each permanent settlement and in some nomadic camps. English was the sole language of instruction, and the avowed purpose was integration of the Inuit into the ways and economy of modern Canada. This imposition of schooling was done rapidly and efficiently. In 1951, less than 10% of native children in northern Canada had schooling in or near their home settlements or camps. By 1981, more than 95% of northern children had access to modern, well constructed, fully staffed elementary schools.

This astounding logistic success in providing schooling has come under great criticism, recently, for its effect on education. In southern, Qallunaat, society, schools are generally seen as extensions of the home; that is, places where the knowledge, skills, and values that are prized in society are taught, demonstrated, or re-inforced by the school. In short the school system is congruent with the educational pattern valued by society. An imposed, non-consultative school system, which not only ignores community educational values, but seeks to destroy them, is totally incongruent and will survive only by coercion. It is generally agreed that the schools of the North are incongruent, and have not served the Inuit well. The interim report of the Special Committee on Education of the Legislative Assembly of the Northwest Territories (Government of the Northwest Territories, 1981) states:

> The people of the N.W.T. had little to say about their schools, in fact, the schools were not theirs, but were often viewed as belonging to the government, which after all had literally built the buildings, and designed the program, and now continued to import the staff.
>
> It would have been a miracle if a school system thus established had been successful. It is therefore no surprise that the schools of the North have not served the majority of its citizens well. In 1980, in a system where over 12,000 students were enrolled, 192 students graduated from Territorial high schools. Of this number, 91 students qualified to enter university, with six Metis, four Inuit, and three Dene students qualified.
>
> There is little indication of improvement in these figures over the next few years. Grade IX graduation figures indicate that of 383 Grade IX graduates, 10% are Dene, 16% are Inuit students, and 7% are Metis students. It should be noted that Metis, Dene and Inuit students comprise approximately two-thirds of the student population of the Territories. (p. 2)

At least part of this failure to provide congruence between the education and schooling for the Inuit can be traced to early and very strong attempts on the part of school authorities literally to stamp out Inuktitut as a language of instruction, or indeed, as a language of communication in the north. At times, students were awarded corporal punishment for speaking Inuktitut within the school (Weetaltuk, 1983). Honigmann (1965) reports that, in 1957, the Education Division of the Department of Northern Affairs issued a memorandum on the use of English in Inuit communities which applied to Inuit and Qallunaat employees alike:

> People charged with administering or teaching the Eskimo should avoid speaking Eskimo simply because they like doing so, for in a day, they could do the people a lasting disservice and jeopardize the whole educational set-up. (p. 186)

This condition of incongruence and mis-adaptation of schooling has been recognized, however, and is in the process of being rectified through the assumption of control of the schools and the schooling process by the Inuit themselves. Two of the main thrusts of this change in control have been the growing use of Inuktitut as a language of instruction and the training and employment of Inuit teachers. This latter development has provided the impetus and resources for the creation of the McGill Native and Northern Certificate in Education.

This process of "Inuitization" and the resultant employment of Inuit teachers has come about quite differently in Quebec and in the Northwest Territories. In order to understand better the McGill program, it is necessary to examine them separately.

Inuit teacher training in Arctic Quebec

In the 1960s, the Government of Quebec, as part of its policy of increased northern sovereignty, set up the Direction Générale du Nouveau Québec (DGNQ), which assumed responsibility for all aspects of life in the northern regions of the province, including the education of native peoples. The policy of the DGNQ was to introduce the native language as language of instruction in kindergarten and grade one, offering free choice of second language to the parents for their children in grade two and the following years. While the implementation of this policy was gaining momentum, Bill 67 (Quebec Legislative Assembly, 1970) created the Commission Scolaire du Nouveau Québec (CSNQ) to take over schooling from DGNQ. The same policy vis-à-vis native language instruction was implemented and, gradually provincial schools were set up in each Arctic Quebec settlement offering the first three years of education (5, 6, 7 year olds) in Inuktitut, followed by elementary and secondary education in English or French. The understanding at the time was that these provincial schools would replace the federal schools, but in practice, the federal schools were relatively slow to move aside. Thus two totally distinct systems of education were perceived by many as competing openly for a grand total of only 1400 students. This anomaly was not completely resolved until the passing of the James Bay and Northern Quebec Agreement.

When the DGNQ/CSNQ decided to offer early schooling in Inuktitut there were no trained Inuit teachers in northern Quebec. Thirty-five competent but non-qualified Inuit, most of whom had been Federal Classroom Assistants, were appointed. They were granted "tolerance" by the Ministère de l'Éducation on condition that they follow an authorized in-service teacher training program. A full-time teacher training coordinator was appointed and, early in 1975, the present McGill program director was approached for help in developing a recognized training program.

A tentative program was put together during a workshop involving all 35 Inuit appointees in Great Whale River (now Kuujuaraapik) in the summer of 1975 and the first formal McGill CSNQ course was offered in Fort Chimo (now Kuujjuaq) in the fall of 1975.

In the meantime, economic development plans in northern Quebec were colliding with orderly political development. This collison culminated in the signing of the James Bay and Northern Quebec agreement in 1975. This agreement, signed by the governments of Quebec and Canada and by the Grand Council of the Cree of James Bay and the Northern Quebec Inuit Association, is designed to settle, for all time, native land claims and allow for the orderly economic development of the 300,000 square miles of Quebec territory bordering Ungava Bay, Hudson Strait, and Hudson and James Bays.

Chapter 17 of the agreement created and financed Kativik School Board, a totally Inuit controlled body which assumed all the assets, functions, and responsibilities of its two predecessors, and was empowered to build a system of education appropriate to the Inuit of northern Quebec. Among the extraordinary powers granted to Kativik School Board were the designing of its own curriculum, the determining of its own calendar and language(s) of instruction, and the training of its own teachers. Kativik immediately invited the CSNQ/McGIll teacher training program to become part of its operation as the Kativik/McGill program.

As a result of this smooth transition, McGill courses have been offered regularly in summer and winter on an in-service basis, in Ungava and Hudson Bay settlements. In 1978, the first eight Inuit teachers received provincial certification, "To teach in Inuktitut in the schools of Quebec," at a ceremony in Inukjuak, marking official recognition of the program.

After some hesitation and a certain amount of internal "politicking", McGill Senate, in May 1981, approved the "McGill Certificate in Native and Northern Education." This 45 credit program recognized, accredited, and absorbed the Kativik/McGill program and the first McGill Certificate was awarded in 1983. Thus Quebec Inuit graduates now receive the McGill Certificate and formal provincial certification. They also become eligible to apply for admission to the Bachelor of Education for Certified Teachers with advanced standing. To date, twenty-one Quebec Inuit are enrolled in the B.Ed. program.

Recent developments in the Northwest Territories

Federal native schooling in the N.W.T. continued in the highly centralized, efficient, but largely irrelevant way described above until the 1970s. In 1969-70, the assets, responsibilities, and functions of the federal system were transferred to the Department of Education within the newly created (1967) Government of the Northwest Territories, with headquarters in Yellowknife. Little basic change resulted, however, and the Special Committee Report on Education of the Legislative Assembly of the Northwest Territories states:

> The system that emerged was essentially a copy of the typical school system that was founded elsewhere in Canada ... The imposition of this foreign system reduced the likelihood that the school would truly serve the needs of the communities. (Government of the Northwest Territories, 1982, p. 1)

A new Education Ordinance, issued in 1977, made some recommendations regarding local control and language of instruction which were very slow to be implemented. On the whole, the school system was still viewed by parents as belonging totally to the government, who owned or controlled buildings, curricula and teachers who were imported, with little preparation, from the South.

Two recent events have occurred which will permanently alter the pattern of education among the Inuit of the Northwest Territories:

1. The Nunavut Movement.
2. The Special Committee Report on Education.

The Nunavut movement is a political idea based on ethnic considerations which would create a new territory within the framework of the Northwest Territories. It has taken form as an indirect result of such landmark agreements as the Alaskan Native Land Claims Settlement, the James Bay Agreement , and Greenland Home Rule.

In short, all territory north and east of the forest line, and north of Quebec, would constitute a territory known as Nunavut ("our land"), with its capital at Frobisher Bay, and its own elected Assembly and administrative structure within Canada. A referendum held across the N.W.T. in 1982 strongly supported the idea (81% in the East and 60% in the West), and the federal Government has given positive, if not enthusiastic, support to the idea. This new territory may well be in place in 1994. Local control of education is seen by the Inuit as one of the key advantages to such a structure.

The Special Committee on Education of the Legislative Assembly of the Northwest Territories was formed in 1980 to examine and make recommendations for the future of education in the N.W.T. Meetings and public hearings were held in 31 communities, over 30 separate briefs were entertained, and dozens of significant persons were interviewed.

The report concludes that education as it exists in the N.W.T. simply will not do. The committee made some forty-nine recommendations, all of which, with some slight amendments, have been passed into law for implementation over the next ten years. Two of these recommendations are directly relevant to Inuit teacher training.

1. All aspects of education are to be put into the hands of locally elected school boards.
2. Teacher training for native classroom assistants and teachers, through to the degree level, is to be given top priority.

The first of ten totally autonomous school boards has been elected in the Baffin region with its administrative centre in Frobisher Bay. Coincidentally, Frobisher Bay is also the present site of the Eastern Arctic Teacher Education Program, (see elsewhere in this volume) the only wholly Inuit teacher training establishment in the N.W.T. and whose students are all enrolled in the McGill Native and Northern Certificate program.

Inuit teacher training in the Northwest Territories

Early in the 1970s, a teacher training program was established at Fort Smith which, though small, was open to all N.W.T. natives (see elsewhere in this volume). Although most of its students were Dene (Athapascan Indians), a handful of Inuit students attended. Those few who remained to graduate were well trained and have been top quality teachers and, in some cases, teacher training instructors.

Political pressure and lack of Inuit students willing to attend Fort Smith caused a full-time Inuit teacher training college to be established in Frobisher Bay in 1979. This Eastern Arctic Teacher Education Program (E.A.T.E.P.) began its two year program parallel with a Classroom Assistant training project based in Frobisher Bay, which had as its goal the training and upgrading of native Inuit working as aides to Qallunaat teachers in Inuit classrooms in the Eastern Arctic.

During 1980, the eventual recognition by McGill of E.A.T.E.P. offerings was tentatively explored and after certain changes in course offerings, general agreement was reached. In July of 1981, the Donner Canadian Foundation approached the McGill program director to initiate a proposal for a Kativik/McGill type community-based teacher training program to be offered in the Eastern Arctic.

A proposal was prepared combining the E.A.T.E.P. full-time program with the Classroom Assistant training program into an integrated community-based/Frobisher campus-based offering leading to N.W.T. certification and the McGill Certificate in Native and Northern Education. The result was a $400,000 grant over four years to support the community-based aspect of this integrated program.

In November 1981, the first community-based course under the new E.A.T.E.P./McGill program was offered in Pangnirtung to a class of twenty combined Classroom Assistants and full-time E.A.T.E.P. students. Since 1981, the E.A.T.E.P. side of the program has expanded both its full-time Frobisher Bay based program and its community-based offerings. At present, a trainee can do two years full-time study in Frobisher Bay, or earn his/her complete Certificate by attending summer and winter community-based courses, or combine the two by doing the first year equivalent by attending community-based courses and then taking a full-time second year in Frobisher Bay. All of these combinations carry full time McGill credit and lead to full certification.

The first six McGill/Northwest Territories certificates were awarded at a ceremony in Frobisher Bay in June 1983. A further 11 were awarded in 1984 and seven are projected for 1985, with a potential 8-10 per year forecast for the foreseeable future.

Present status and future projections

Ten years after its beginnings as a tentative response to a training need for Quebec Inuit teachers, the Native and Northern Education program has reached relative maturity. Some twenty-nine have received Provincial or Territorial Certification, and of these twenty-nine who have graduated since 1981, eighteen also hold the McGill Certificate.

The holding of two certificates by a teacher, while awarded for the same work, is not redundant. The first is essentially a "license to teach", while the McGill Certificate makes the holder eligible to apply for advanced standing in the McGill Bachelor of Education for Certified Teachers. Some forty-nine students have been accepted into this 60 credit (two year) program and the first of these will receive her B.Ed. in 1985. The McGill Certificate therefore provides the first step towards full professional degree level recognition and competence for Inuit teachers, and is the only formal university level program offered in Arctic Quebec or the Eastern Arctic.

During the current (1984-85) academic year, eight students (two of whom are Qallunaat) have been enrolled in a small, full-time, post-certificate Bachelor of Education program in Frobisher Bay. Instruction is given primarily by full-time E.A.T.E.P. staff, but four McGill professors, two Kativik School Board instructors, and other itinerant teachers from as far away as New Mexico and British Columbia have taught courses or parts of courses in this B.Ed. program.

Four new courses in academic Inuktitut have been developed at the B.Ed. level to serve this group, the most recent of which is a six-credit course in Inuktitut Literature and Composition, to be offered in Frobisher Bay in July, 1985.

Besides the B.Ed. program in Frobisher Bay, a unique project for the training of Inuit to work as teacher training instructors has been developed by Kativik School Board and the McGill program in Arctic Quebec. Because the amount and level of English used by the Inuit in Arctic Quebec is less than in the Northwest Territories, some way had to be found to offer training courses in Inuktitut. With the help of a generous grant from the Ministère de l'Éducation, a four step process has been developed whereby Inuit graduates of the program learn to develop and present courses in Inuktitut to their confreres without intervening translation to or from English and Inuktitut. This has had a measurable effect on both the morale and competence of unilingual (Inuktitut) trainees who can achieve full certification in their own language. Some twelve Inuit instructors have received this special training and are now recognized as McGill Sessional Lecturers in the Faculty of Education.

Structure of the program

The official home of the Native and Northern program is in the Department of Elementary Education of the Faculty of Education at McGill. The 45 credits of the program center on two main axes:

1. Inuit Child Development, a four course (12 credits) concentration focusing on ideas, processes, and

methods specific to the physical, emotional, psychological, social and cognitive development of Inuit children in and out of school.

2. All aspects of Inuktitut, from initial speaking and understanding through the syllabic and Roman writing systems to the more sophisticated linguistic concepts of phonology, morphology, and syntax.

Besides these two core components, there are courses in Educational Administration in the North, Mathematics for Inuit Children, Cultural Skills, an intensive practicum, and an extended teaching internship in a classroom setting involving all aspects of student teaching in a northern setting.

The program is very Inuk. This is deliberate. It is similar to a training model developed for the indigenous peoples of the extreme north and east of the Soviet Union, which insists upon clear, unequivocal cultural identity and total mastery of the native language before the language, teachers, and culture of the dominant majority are introduced in the classroom. The native teacher as competent, knowledgeable, admirable role model is seen as the single most important factor in the educational development of northern children.

To enter the program, then, one must normally be 21 years of age, totally fluent in Inuktitut, hold employment as a teacher or classroom assistant in a northern school, and be recommended by a school principal, an official of the Educational Authority, and, most importantly, by the native Educational Committee of a local northern settlement.

The logistics involved in the operation of the Native and Northern program are enormous. Students from 37 settlements as far as Coppermine in the west, Broughton Island in the east, Grise Fiord in the north, and Kuujuaraapik in the south have taken courses in eighteen widespread communities as far afield as Nuuk in Greenland. This community, or field-based, aspect of the program is perhaps its unique feature. In the Northwest Territories, the full-time campus-based program in Frobisher Bay is supplemented by some four to six field-based courses per year plus an intensive four-week summer institute for sixty or more trainees in Frobisher Bay each July. Kativik School Board has no full-time program but offers a large summer program plus four to six field-based courses each winter in Arctic Quebec settlements. To date, only one course session has been given on the McGill campus in Montreal, with two more scheduled for June of 1985.

The sense of community

Because field-based courses are the backbone of the program, it is, perhaps, worthwhile describing in some detail the frustrations, advantages, anxieties and sheer fun in their production. The basic rationale for field-based training is not only that the training of Inuit teachers for Inuit schools is a top priority in the north, but that training teachers in the cultural environment in which they will work is more effective than training them in an alien vacuum jar set down on some southern university campus. During the only course offered to date in Montreal, the course content (Music and Art) was thoroughly enjoyed, but the common complaint was that there was nothing to do in spare time. "Back home when we are not working, we can visit, drink tea, make bannock, go hunting, go to church, or play cards. What do you Qallunaat do in your spare time here in Montreal?"

An additional, serendipitous result is the feeling of participation in and "ownership" of the training process, which springs up, overnight, in a community used for a teacher training course. There is a warm feeling of belonging among both staff and trainees when, at any given time, there may be five or six interested parents or other concerned adults, including a hunter, a local policeman, the postmistress, or the Air Inuit agent, sitting at the back of the room, sipping coffee, listening intently, and joining in the discussions. In one settlement, the mayor, after observing for two days, went on the local FM radio station (the ultimate communication device in each settlement) and announced a curfew on all noise in the settlement during the evenings so that "these teachers of ours can learn." The final feast and dance at the end of the course more than made up for the silent evenings.

Children are everywhere. The traditional inclusion of children of all ages into every activity in an Inuk community is, fittingly, a very important part of any community-based teacher training course. Invariably, four or five of the trainees will bring babies with them from their home settlement to the course. Since the trainees stay in local homes, accommodation is simply expanded slightly to fit the babies, and the younger member of the family is appointed babysitter. At various times of the day, depending on feeding schedules, the door of the classroom will open quietly and the babysitter, dressed in traditional amautik with the baby in its hood, will present the baby to its mother, be she trainee or instructor, for breastfeeding which is carried out without the slightest interruption in the flow of the training session. Larger children come and go all day long, are often used for demonstration of principles and techniques learned, or simply play quietly or observe, entranced, as the course proceeds.

This completely child-centered atmosphere, existing within a small, intimate, traditional community, is the quintessence of the program. Whether the course is given during a four-week period of sea breezes, insect clouds, and twenty-four hour days of the summer, or during a two-week period of minus 45 degrees, raging winds, and twenty-four hour nights of winter, the training is seen to be done by those people it is designed to serve. When in such a setting, a trained Inuk instructor explains a complicated concept for the first time ever in Inuktitut, the response is often "Tukisilitainaqunga." ("Suddenly I understand.") At times like these, the program is doing its job.

An individual field-based offering is, of course, only the culmination of, or showpiece for, an immense amount of work done elsewhere. In Arctic Quebec, preparations must include the training of the Inuit instructors, as described above, the preparation of all materials in the Dorval office of Kativik School Board and their transport north, and arrangements for all the trainees to be released from their jobs for the period of the course. In addition, in the Kativik model, the teacher training department is in charge of the development of curricula for all Inuktitut programs throughout the whole school board. Consequently, training courses provide not only competence training for teachers but are the curriculum development branch for the whole of the primary school.

In the Northwest Territories, the field-based courses are logical and integrated extensions of the full-time campus in Frobisher Bay. Each field-based course is the exact equivalent of the same course given in the full-time program, so that teachers can proceed on a part-time, full-time, or combined track towards certification. Besides the high quality of its offerings, the full-time program is necessary to provide continuity for trainees, scattered over an area which is vastly larger and has much less homogeneity than Arctic Quebec. Each of the three regions in the Eastern Arctic, Baffin, Keewatin and Kitikmeot, quite rightly demands its share of field-based courses. This places a great strain on the full-time staff in Frobisher Bay and necessitates the employment of individual contract instructors, experts in their field, who travel north for one or two courses per year. This crying demand for more courses is, I believe, evidence of the success of the program, but there are times when it seems as if there are not enough qualified instructors or, indeed, enough money in the world to meet the voracious, yet heartfelt, demand for training courses.

Some criticisms and concerns

Certain legitimate criticisms have been levelled at all aspects of the Native and Northern Education Program. Field-based courses are, of expediency, too short. Training programs, given solely in isolated regions, deprive students of access to regular university resource facilities, including libraries. Parts of the program tend to become "inbred", that is, the same intimacy and mutual trust amongst a small select group which gives the program its strength, also can be seen as protecting trainees from the intellectual stimulus of the so-called "real world". There are times during which each of these criticisms is valid. Ideally, given the budget, and the possibility of gaining release time for trainees, a course in even the remotest community should be three weeks to a month long. This dilemma is compensated for somewhat by giving follow-up assignments to each student to be carried out in his or her classroom on return home and by constant monitoring, counselling and visiting by the full-time staff members of both the Kativik and E.A.T.E.P. programs. Access to libraries and the "learning in a vacuum" problem are gradually being overcome in two ways. More and more outside persons are being brought in, while library and media holdings in each of the settlements are growing constantly. This improvement in information services for teachers and trainees in the north has top priority both in Arctic Quebec and the Northwest Territories, and the growth in Inuit literature and Inuktitut teaching materials and resources over the past three years has been phenomenal. The Bachelor of Education program in Frobisher Bay, and the eventual offerings of second and third year university level courses for Inuit students on the McGill campus in Montreal, will bridge the gap between northern scarcity and southern superfluity of intellectual stimulation. It is projected that by 1986, some ten to twelve Bachelor of Education level Inuit students will be attending full-time courses in the south for the final year of their degree program.

The ever present worry that permeates every northern course is logistics. Airfares for southern instructors and consultants cost as much as $1,600.00, for example, Montreal-Gjoa Haven return. Eighteen passenger Twin Otter charter aircraft, the standard workhorse of the north, cost $7,000 or more per day. With food and lodging costs being 150-300% of Montreal basics, delays due to weather, mechanical failure, or poor planning add thousands of dollars and many wasted days to the cost of the course. There have been times when, because of wind, weather or mechanical failure, a student has spent four or five days trying to get to a course only to give up and return home disappointed. One southern "knowledgeable" consultant, through ignorance and bad planning, proudly arrived on the plane that was to take him home.

Typically, of the twenty students attending a course, five are from the local community and fifteen are flown in by scheduled or chartered flights from as many as eight other settlements and billeted in family homes for the ten to fifteen day session. Consultants and instructors are brought directly from the south or from Frobisher Bay, with a dozen or more boxes of teaching materials, and live either in a transit house or in a local hotel, where they can plan, adjust, and adapt their courses at any hour of the day or night without disturbing others. When a community is particularly small (e.g., two hundred to three hundred people), has no Hudson's Bay Company store, or if a supply ship is overdue during a summer course, it is often necessary to bring in extra food since the addition of twenty-five mouths to the community for two to four weeks simply overtaxes local food supplies. Fresh fruit, vegetables, and cheese are the standard "carry-in" food to any community, large or small. Invariably, the local school committee and principal make all local arrangements with great care and attention. Planes are met, housing arranged, classrooms organized and people fed with no apparent effort, but with obvious meticulous planning. No job is too awkward and no detail too small to be dealt with by these remarkable communities.

A typical scenario

Packing up and leaving a course should, logically, be just as smooth a process as arriving, but for some reason, it is always more complicated. Instructors, students, and even program directors are exhausted. The twelve boxes of raw materials that came in with the instructors have suddenly become twenty boxes of newly minted curriculum and classroom aids for the students to carry away with them. Sarah's husband has joined her after a week of caribou hunting and needs a ride home on the charter. Students have each been given a large bag of land food by the families they have been living with to munch on while travelling. The charter for those going up the coast is due to arrive at 8:00 a.m., for those going down the coast at 10:00 a.m., and for those going directly to Montreal, the scheduled flight leaves to connect with the jet at 2:00 p.m. All is logically planned and about to be beautifully executed.

Then the phones all ring at once. The weather is "out" with snow and blowing snow up the coast, but is "in" down the coast.

However, the down-coast airplane is stranded in the up-coast weather. Besides the "sked" is running late, so the connection to Montreal won't be made anyway.

Meanwhile, the nurse says that Mina's baby is really quite sick and should go down the coast to the hospital rather than up and home. O.K., find a seat and a half for Mina on the down-coast charter. Is there a seat up the coast for the building maintenance man who has a plumbing emergency in the school two settlements away? Yes, he can have Mina's seat.

Two false trips to the airstrip. Two false alarms. Back to the school and all of a sudden it is noon. The standard northern rule comes into effect: Hurry up and wait.

Everyone's food bags are opened, so there is boiled seal, raw char, dried caribou, bannock, and tea for lunch. What could be nicer.

Everything begins to unwind, lunch is half-eaten, tensions go, and the room is all warm and giggly ... Airplane. A low flying Twin Otter passes over the school and lands on the strip. Which charter is it? Let's take no chances, everybody on to the truck.

Where is Leesee's little boy?

"Pootilik qaigit."

Pootilik has been visiting his cousin for ten minutes, and has acquired a new puppy. Is there room in the charter? Of course, why else are we flying except to take this puppy to a new home. He can sit in the maintenance man's lap. Good news, it is the down-coast charter. The weather is "in" all the way. Load seven material boxes, baggage, seven students, one half caribou in a green plastic bag, Sarah's husband, a box of frozen char, three babies, and Elijah's grandmother who has decided to go home with him for a visit. Just make sure her name is on the manifest and get this plane in the air. Please?

This is no sooner done than ... Airplane. The second charter.

"Who and what is going up the coast?"

Loading starts: Baggage, twelve material boxes, twelve student teachers.

"Mina, weren't you going down the coast to the hospital?"

"On no, my baby looks better so I am going home."

"You didn't tell us."

"I changed my mind, she is going to get better on her own."

Add to the load:

One student and one baby.
Four kids, and Pootilik's puppy.
Ooloota's three year old son jumps off again.

How about the maintenance man?
Here he comes in the truck, with his tools.

Add to the load:

One large maintenance man with two hundred and fifty pounds of tools in two giant boxes.

The pilot growls something about people who think a Twin Otter has the same capacity as a Hercules.

Mina's baby calmly leans across her mother's knee and throws up on the airplane floor, and, in the way of babies since the beginning of time, smiles benignly and is instantly and totally cured.

Pootilik's puppy establishes immediate rapport with the maintenance man by peeing in his lap. The pilot laughs delightedly and clambers up the aisle to the cockpit.

Ooloota's wandering three-year-old is scooped on board for the fourth time, clutching a large rock, and the airplane door is finally and mercifully closed, tight.

The pilot prudently taxis to the extreme end of the soft gravel strip, then reverses pitch and backs the airplane up so that its tail extends off the end of the strip, overshadowing the tundra.

"Is he overloaded?"

"Twin Otters can lift anything."

"Even the maintenance man's tools on top of a full load?"

"Let's hope so."

The engines rev to full throttle and full pitch, smiling faces and waving hands appear at all the windows. With a slow faltering start, then a sudden burst of speed, the Twin lumbers into the air, makes a slow 90 degree turn, missing the hill at the end of the airstrip by at least twenty feet, and climbing leisurely, winds its way down the fiord and up the coast.

On the ground, all the white knuckles turn pink. Taimat. It is finished. Relief is replaced by instant loneliness. They are all safely gone and there is nothing more to do.

But more news on the phone, the "sked" is back on time and due on the strip in an hour.

"How about a final cup of tea down at Louisa's?"

"With a bit of luck, we may just see the lights of Montreal tonight."

"Won't a hot bath and a hot rum feel lovely."

Acknowledgment

The program described has been generously supported by grants from the Donner Canadian Foundation and the Ministère de l'Éducation du Québec. There are four persons without whose dynamism, optimism, and dedication the program would not exist: Hélène Beauchemin and Doris Winkler, of CSNQ/Kativik, and David Wilman and Mick Mallon, of E.A.T.E.P.

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Note

Reprinted, with permission from Vol. 20, No. 2, Spring 1985 issue of the McGill Journal of Education, 113-132. Most of the articles in this section, notably those of Wilman, Padlayat and Winkler, Stairs and Loague, complement this article. (ed)

TEACHER TRAINING IN THE CANADIAN EASTERN ARCTIC

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Take a map of the Northwest Territories. Find Gjoa Haven, on an island off the Arctic Coast, approximately 1850km. north of Winnipeg. From there south to the sixtieth parallel and east to Hudson Bay and the Davis Strait is the area served by the Eastern Arctic Teacher Education Program (EATEP). No other native teacher training program in North America serves an area so vast or as isolated as that served by EATEP. In this vast and isolated area, some 1500km. east to west, 1600km. north to south, which encompasses the Territorial Government's Baffin, Keewatin and Qitirmiut administrative regions, more than 90% of the children come to school speaking only their mother tongue, Inuktitut (GNWT 1984). Throughout this area schools are controlled by locally elected education councils and in most communities Inuktitut-English bilingual education programs are in demand. Where the community wishes it, legislation (GNWT 1977, 1982) requires that children should be taught through the medium of their mother-tongue, Inuktitut, at least for the first four years of the elementary school. The same legislation also requires the provision of Inuktitut instruction as a regular component of school programs at all grade levels beyond these introductory years. This means there is an urgent demand for Inuktitut learning material and for Inuit teachers. This paper discusses only one half of the needs: teacher training.

After two tentative experiments in the early 1970's, the Eastern Arctic Teacher Education Program was set up in Frobisher Bay in 1979 as an offshoot of the teacher training program of the Adult Vocational Training Centre located at Fort Smith in the western NWT (see elsewhere in this volume). At that time in Fort Smith there was a two-year institutional program, with the emphasis on English instruction. Any ties to Fort Smith were quickly severed and what we have developed in the Eastern Arctic is radically different. From the start, our emphasis has been on producing teachers capable of teaching in Inuktitut from Kindergarten to Grade Three. During the last two years, as our graduates began to fill many of the teaching positions in the lower elementary grades, we have expanded our objectives to include training for work at the upper elementary and junior high school levels. In addition, the program is no longer simply institutional. We have incorporated into the teacher training program the previously separate classroom assistant training program and now offer not just an institutional teacher training program, but a field-based, on-the-job, training program for classroom assistants (paraprofessional teachers) who otherwise may not be able to undertake any kind of planned professional training because of their isolation, family commitments, or because of other restrictions on their mobility.

Because of the language situation, many Inuit classroom assistants in the Eastern Arctic had developed the skills of independent teachers, but the credit they received for the courses and training they had completed could not be counted towards teacher certification. Even the most experienced and well qualified classroom assistants had to begin again at square one if they wanted to earn full teaching credentials. We have changed all that. Now there is a set of EATEP courses accredited by McGill University leading towards the Certificate in Native and Northern Education and the NWT Standard Teaching Certificate. These courses can be taken full time in the institution, or during the summer, or, thanks to a $400,000 grant made by the Donner Canadian Foundation in 1981, through intensive field-based courses offered at different locations during the winter to classroom assistants and institutional trainees alike. Trainees have considerable flexibility: most now do the equivalent of first year in the field, spread over two, three or more years, and then come in for one institutional year, thus completing the requirements of the present two year program, which qualifies them for the teaching credentials noted above.

Recognizing the need for more specialized training, in September 1984 we began a third year program for Inuit teachers who had earlier graduated from either EATEP or the Fort Smith program. This program, like the first and second year programs, consists entirely of courses drawn from the regular McGill catalogue but offered in Frobisher Bay by our own faculty and by visiting McGill University professors. It is not expected that students will attain the B.Ed at the end of this third year, but many of them who have credits from our earlier summer school B.Ed offerings will have more than 75% of the credits required for the degree. Normally students can earn their degree after one additional semester of study carrying a regular load of three or four courses. The first Inuk from Nunavut to graduate with a B.Ed. through EATEP did so in June 1985. Two more Inuit completed their B.Ed. degrees in December 1985, and one of these has now been admitted to graduate studies at McGill. It is interesting to note that two of the seven students in the B.Ed. program during its first year of operation were non-Inuit northern teachers, and that of the seven recipients of educational leave for the 1984-85 school year, three chose to study at EATEP.

Naturally there are problems. Too few qualified Inuktitut-speaking instructors, too much English, too few high school graduates applying for the institution, too many field-based students scattered across too many kilometres, too many demands on too few staff, too little time, too little money, and much too much bureaucracy. And yet we have hopes. Hopes of a significant increase in number of experienced Inuit teachers working in our schools, of taking responsibility for Inuktitut curriculum development, of training language specialists and bilingual educationists, and of creating career paths beyond the B.Ed. for Inuit teachers who aspire to more advanced studies. High hopes, high inflation, low budgets, lots of problems . . . . we doubt our sanity sometimes.

One problem emerged clearly in a recent evaluation which was otherwise highly favourable (Carney 1984). It was commented that EATEP graduates had problems with the teaching of English as a Second Language. This is not only true, it is also predictable. As indicated in the second paragraph of this paper our initial mandate was to deal with the disastrous lack of certified Inuktitut-speaking teachers in the educational system of the NWT. In its first twelve years, 1968 to 1980, only thirty-five Inuit teachers had graduated from the teacher training program at Fort Smith (Teacher Education Program 1980). In May of 1981 only twelve of this group were still serving in the more than 120 K-3 classrooms where teachers able to teach in Inuktitut were desperately needed (Wilman 1981). Of these, none were teaching above the grade four level. It would have been impossible, in a two year program, to produce teachers of Inuktitut who were also TESL or any other kind of specialists. In considering this issue it should also be pointed out that the Department of Education has failed to hire or train a cadre of TESL specialists among their southern-hired native speakers of English. While presenting a paper at a recent teachers' workshop in Frobisher Bay, the writer asked a group of more than forty southern teachers to indicate if they had taken any TESL training. Only the writer and one other teacher raised a hand.

We must emphasize that it is not sufficient to provide trainees with one TESL course and then expect them to function efficiently in the multicultural, bilingual situation that exists in most classrooms in the Eastern Arctic. We therefore intend, given resources, to offer within the B.Ed. program and beyond, the opportunity to acquire a specialist certificate in second language teaching. If our graduates are to function as competently with TESL as they do in Inuktitut, they need the same kind of integrated set of courses as is at present provided for their first language.

In order to introduce more Inuktitut instruction into the training process itself, two early graduates of our program were hired as trainee instructors after two or three years in the classroom. A carefully scheduled three-year program of academic study and professional development was prepared for each trainee. These programs were designed to equip the trainee instructors with the academic background and experience they would need before taking on the responsibilities and pressures of a permanent faculty position at EATEP. One trainee completed her program in 1985 and now holds a full teaching position specializing in Inuktitut language arts, drama and cultural studies. The second will complete her program in 1987 and will specialize in linguistics and computer education. A third trainee will begin in September this year.

In our negotiations to establish and offer B.Ed. courses in Frobisher Bay, McGill University were particularly helpful. McGill provided logistical and pedagogical support, appointed two of EATEP's permanent staff to faculty at the University, approved the establishment of several new academic courses, and encouraged faculty to visit Frobisher Bay regularly to offer seminars and instruct sections of our B.Ed. program. McGill encouraged us to develop a fifteen credit academic Inuktitut component. This block of courses includes three three-credit linguistics courses dealing with the phonology, morphology and syntax of Inuktitut, and a six-credit course in Inuit literature. The Inuit literature course has had an interesting spin-off. EATEP, in association with the Hochelaga Research Institute of Montreal (see elsewhere in this volume), has acquired an exhaustive collection of some 3000 books, papers and periodicals in Inuktitut or written by Inuit and published in other languages. This collection, which contains many rare and valuable books, is fully catalogued and is now situated on our premises in Frobisher Bay, where it is available to both our students and other scholars involved in research on the Inuit language and culture. Our students have named this unique collection *Isumaksaqsiurvik*, literally "the place where you search for knowledge."

This probably sounds impressive enough. Does it work? Evaluations tell part of the story; the reactions of trainees give another clue. Early in our summer programs students began to give indications of an emotion closely resembling enthusiasm. One young lady had to leave class early on a Wednesday to have a baby. On Saturday she was back in class, apologizing anxiously to the writer for missing class on Thursday and Friday. We forgave her: she passed that course and eventually entered the second year institutional program, graduating as a teacher in June 1985. Not every trainee has the opportunity to display commitment so obviously; not many would. We who teach in the program, and who make no pretence of being objective about it, claim to notice a marked increase in determination and career ambition among the young people we work with.

Another indicator of such enthusiasm, presumably less subjective, is statistics. By June 1986 EATEP will have graduated 50 teachers. All but two of this group are either working in our schools or have returned to us to continue their studies towards the B.Ed. degree. In addition to our own graduates, seven Inuit teachers who earlier graduated from the Fort Smith program have registered in our B.Ed. program. Since the establishment of the field-based program in 1981, more than 140 classroom assistants have registered for the McGill-EATEP Certificate in Native and Northern Education. Of this number, 45 are no longer active, mostly through resignation from their posts, but in each of the three regions we serve there is a strong, active, contingent of classroom assistants pursuing a coordinated program of studies which will lead to a CA Diploma, to teacher certification, and eventualy to a full degree. At time of writing, 78 classroom assistants are active in the field-based program, these in addition to the 21 institutional trainees, and the 45 graduates registered in our B.Ed. program on a part-time basis.

Since November 1981 EATEP has offered field-based courses in the three regions of the Eastern Arctic, Baffin, Keewatin and Qitirmiut, and in Nuuk, Greenland. Students in the field-based program can take up to five courses per year, two each summer and three during the regular school year. If a course they require is being offered, arrangements are made to release them from their regular classroom duties, and for them to travel to the community where the course is being offered. Until November 1985 these courses were funded by the Donner Foundation grant and provided the opportunity for classroom assistants, who otherwise had only infrequent access to training, to quickly acquire the basic teaching skills they need in their work, and to proceed from there towards full teaching credentials. It is now possible to earn full teaching credentials through the field-based program. By June 1986 EATEP will have offered 18 fully field-based courses for university credit, seven in the Baffin region, eight in the Keewatin, and three in Qitirmiut. In addition our institutional schedule is arranged so that field-based trainees can regularly join our institutional classes during the school year. This arrangement is particularly cost-efficient. It more than doubles the number of courses available to field-based trainees each year. Further courses at the first year, second year and B.Ed. levels are available each year through our annual July Summer Program. We estimate that by the summer of 1990, we will have graduated 80 trained Inuit teachers.

We've had help. Kativik School Board of Northern Quebec (see elsewhere in this volume) paved the way in developing field-based programs in the Arctic and provided part of the model we have developed. We have also adopted part of the approach taken by the University of New Mexico's Navajo Teacher Education Development Program. We learned much from these programs, but naturally we have had to make our own experiments and adjustments so that our program would best serve the needs of our own clientele. Dean David Smith and Professors Jack Cram and Gordon Bennett of McGill University have given us unfailing support in our efforts to establish a high quality teacher training program in the Eastern Arctic. And of course our field-based courses could never have been possible without the generous support of the Donner Canadian Foundation. That funding has now expired, and one of our immediate concerns is to identify a source of further funding for this vital aspect of our exciting program.

The recent formal, external, evaluation of our program (Carney 1984), while very encouraging, served to show us where our weaknesses lie. In responding to these issues our task for the near future is to refine, to fine tune the programs and approaches which have already proved to be in accord with the needs of the area and people we serve. This is now the challenge for the program. It is a challenge we will meet with the same determination and innovation which have been our hallmark to date.

This paper is an updated and expanded version of an earlier piece by David Wilman and Mike Mallon.

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TEACHER EDUCATION PROGRAM, FORT SMITH

Nehume Loague

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The Teacher Education Program (T.E.P.) was started in 1968 under the leadership of Mr. Aldrich (Audie) Dyer. In his article prepared for the Tenth Anniversary Yearbook of the program, Mr. Dyer writes of the humble but challenging beginning:

It took two years of patient negotiation with the Teachers' Association, the University of Alberta and various other officials . . . September 1968 arrived and so did fifteen candidates. They boarded at private homes in Yellowknife. We met as a group in

> the old construction shack which had housed workers who had built Sir John Franklin School. Jean Hodgkins and I were the only staff. We had no heat, nor furniture, no books and very little confidence . . . Whether they taught or not, the graduates of that Experimental T.E.P. (1968) had impressed a number of people. Questions were raised in the House of Commons; the Territorial Council consumed endless hours of debate about the Teacher Education Program. T.E.P. was reported in *Monday Morning*, *The Ottawa Citizen*, and *Montreal Star* and even mentioned in the landmark, Watson Report.
>
> . . . Your program has been studied, copied and emulated throughout the whole nation. Every province and territory now has at least one native teacher education program. Your program is the senior and premier program in Canada.

From this program have come individuals who are playing leading roles in Local Government, native associations, the Arctic College, the administrative and teaching ranks of the elementary educational system in the Northwest Territories, as well as in other areas of employment. The Task Force on Aboriginal Languages which submitted its report early in 1986 had three T.E.P. graduates. In addition, an increasing number of graduates are deciding to continue the work towards a degree. Consequently, twenty-two of the one hundred twenty-four graduates have now received the Bachelor of Education degree, one has obtained the Master of Education degree, four are full-time university students, and two plan to enter university in September, 1986. The program has endeavoured to meet three essential goals —the provision of bilingual teachers; the education of professionals who, by upbringing and experience, are of the same culture as the majority of the students whom they will be teaching; the development of graduates with a desire for lifelong learning.

Over the years, the mandate to produce bilingual graduates has remained a fundamental goal of the program in spite of the changes in its form and content to meet the needs of the clientele which it serves. This desire to meet local needs led to the separation of the Eastern Arctic Teacher Education Program (EATEP) from the Teacher Education Program (T.E.P.) in Fort Smith in September 1979. EATEP (see elsewhere in this volume) catered to the majority of individuals who spoke their native language as a first language; T.E.P. to a mixed group including some individuals fluent and literate in their native language, some who could understand but could not speak the native language, and still others who had lost their native language completely. Moreover, this western group had individuals whose backgrounds comprised a variety of native languages — Cree, Chipewyan, Dogrib, Loucheux, Slavey, Inuktitut, Inuvialuktun, French and English. It is therefore more than a coincidence that eighty-nine (that is, approximately seventy-one percent) of the T.E.P. graduates are bilingual.

Going hand in hand with the efforts towards bilingualism has been the endeavour to make the cultural and environmental factors essential parts of the delivery system of the courses offered. In 1984, the addition of a full-time staff member with a strong background in linguistics ensured that even the student teachers who had lost their language were guided through a scientific analysis of the native languages. Consequently, the students gained an objective understanding of some of the problems faced by the pupils they expected to teach upon graduating from the program. Combined with the socio-cultural inclusions in the courses, this added dimension sought to enhance, within the limited time available, an essential cultural element.

Up to the 1985-1986 school year, the efforts to instill the graduates with a wish to continue the search for knowledge were approached on two fronts — two years' work in the Northwest Territories and a six-week intersession at the University of Saskatchewan. One of the reasons for including the work at the University of Saskatchewan (and, before that, at the University of Alberta) was to give the students the opportunity to become familiar with a university with the hope that they would be encouraged to further their studies.

At present, the students who successfully complete two years at the Teacher Education Program in Fort Smith can receive the credits listed below.

COURSES OFFERED BY THE TEACHER EDUCATION PROGRAM FORT SMITH, N.W.T.	COURSES FOR WHICH CREDIT IS GIVEN BY THE UNIVERSITY OF SASKATCHEWAN
Language Arts I	ED CUR 271.3
Language Arts II	ED CUR 240.3
Educational Psychology I	ED PSY 251.3
Educational Psychology II	ED PSY 255.3
Art Methods	ED ART 231.5
Science Methods	ED CUR 220.3
Social Studies Methods	ED CUR 280.3
Methods in Mathematics	ED CUR 210.3
Physical Education	ED CUR 250.3/P.ED 140.3
Kindergarten Methods I	ED CUR 231.3
Kindergarten Methods II	ED CUR 331.3
English As a Second Language	ED CUR 291.3
Educational Administration	ED ADM 321.3
Student Teaching	EX PR 431.3
Classroom Management	ED PSY 431.3
Native Languages	6 Credit Units of Language
Educational Foundations	ED FDT 320.3
Music Methods	ED MUS 230.3

During the past eighteen years many instructors have had the satisfaction of watching students blossom into excellent, good, or satisfactory teachers. The idea of being the first native Teacher Education Program (T.E.P.) is not to be compared to the importance of having frank feedback both before and after the graduation of the participants. This feedback helps those who are involved in the program to preserve what is perceived as good for the development and maintenance of excellence and to change what needs to be modified to achieve that excellence. It indicates that there is a group whose self-concept is high, a group with confidence that their suggestions will be considered.

Three T.E.P. graduates will complete the requirements for the Bachelor of Education degree this year. The invitation extended to a member of the T.E.P. staff to share the graduates' feeling of satisfaction by participating in the 1986 graduation ceremonies at the University of Saskatchewan seems a fitting end to the period which started with Mr. Dyer in 1968. In September, 1986, a revised program will come into existence.

EDUCATION IN NORTHERN QUEBEC

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Education in traditional Inuit culture was holistic. All members of the community played a role in the child's total growth and development and learning was not split into categories. Children acquired skills and knowledge at an individual pace and they grew up in an environment where mutual aid was the key to survival and competition had no place.

The introduction of schools in Northern Quebec in the late 1940's changed this situation dramatically. It resulted in total division between school and community and disrupted traditional patterns of learning. It created a discrepancy between the child's culture and the culture of the school and this has largely been responsible for the students' poor school performance.

In the 10 years before education was given back to Inuit through the Kativik School Board, most settlements in Northern Quebec had two schools: the federal system where instruction was in English only and the provincial system where the first three years were taught in native language and from Grade 3 up French was the language of instruction. The provincial system also set up parent committees, started some local program development and developed a training program for its Inuit teachers. It is, however, no exaggeration to say that, despite these differences, the first thirty years of schools in our north forced Inuit students into a southern curriculum, with southern teaching methods and southern evaluation measures. The underlying assumption was that Inuit culture had no valid ways or means to educate its young for 'modern' times. Students who were fluent enough in English were sent south to secondary school which few of them managed to finish. Parents were no longer meaningfully involved in their child's education and were powerless when facing the southern education system. Research that was carried out in those days involved Inuit as informants only, not as equal partners.

The Kativik School Board of Northern Quebec was established through the James Bay and Northern Quebec Agreement in 1975 and officially assumed responsibility for education north of the 55th parallel in 1978. With an area of about 250,000 square miles it has the largest school territory in Canada. It offers primary and secondary schooling to about 2,000 students and provides academic upgrading and technical-vocational education for about 500 adults. It has the unique mandate to train its Inuit teachers and it is presently also exploring ways of making post-secondary education available in northern Quebec.

KSB has control over all *program development* in the three languages of instruction (Inuktitut, French, English), carries out its own *research in education*, and controls the content and quality of the *training program for its Inuit teachers*. Important progress has been made in all these areas and this has been possible through close collaboration between Inuit professionals and qallunaat (non-Inuit) consultants. Working in an equal partnership they have trained each other and are continuing to learn from each other. This training component is crucially important and if development work is to be successful such training must be reciprocal.

Research

The Child Observation Project through Inuit Teacher Training (COPITT) was started in 1979. One of its aims was to establish norms for Inuit students in all areas of child development and to help us develop programs and teaching methods which would respect the northern child's learning patterns. Through it we have developed diagnostic tools which allow us to screen all students when they first enter school and to make provisions for remediation where necessary. All research findings are immediately fed back into program development and teacher training courses. Continuing cycles of research, development, evaluation and revision through close involvement of our teachers lead to continuous updating and improvement of our programs. For a summary of COPITT work to date see the article which follows this one.

Programs

With three languages of instruction and all levels of schooling (kindergarten, primary, secondary) it was not possible to create new programs and teaching materials in all subject areas at the same time. Human and material resources were limited and priorities had to be set accordingly. Attempts at translating existing programs from English or French into Inuktitut had failed and for the past five years all development in subject areas which are taught in Inuktitut is done in that language through involvement of a language committee composed of elders and teachers. We now have programs available for most of the primary grades in the three languages. The majority of our students begin schooling in Inuktitut and after three years continue either in English or French. Our programs are developed according to this pattern and every attempt is made to build a solid bridge between early learning in native language and later learning in second language. At the higher levels we still rely on southern programs and materials, but it is the full intention of the School Board to eventually replace all of these with curricula that are developed for northern students.

It is a great advantage to have research, program development and teacher training so closely linked for it allows us a flexibility which is crucially important in development work.

Teacher Training

Our Teacher Training program is very different today from its initial pattern back in 1976. Major changes in course content and weight were initiated by the first graduates. Compared to southern teacher training profiles we place much more emphasis on child development courses, research methods, and special education methods. The establishment of Inuktitut as the language of instruction in all teacher training courses has greatly broadened the range of possible candidates. Not surprisingly, unilingual teachers figure among our best. We know that their input in the development of an Inuit education system is very important. To train Inuit teachers in Inuktitut, we also have to train Inuit instructors and this has helped us eliminate the danger of having meaningless course content and instructor styles that clash with the needs and the learning styles of the students. As each course is developed with Inuit instructors the latest research findings, as well as the experience and background of the prospective students are considered. All courses are offered in the north in a pattern where on-the-job training alternates with course work. Just as with programs, the courses in our Teacher Training program are under constant revision. We know that having our own profile for training Inuit teachers has strengthened the program. For details concerning the Teacher Training program see other articles in this volume.

Beyond Teacher Training

As the graduates of the Kativik-McGill University Teacher Training program continue their studies towards a bachelor degree we are becoming increasingly aware that at this level, too, northern needs are not necessarily met by southern profiles. These may even be counterproductive for Inuit students for their interests and work experience are not necessarily recognized in these profiles. Especially at this point in time when none of us knows what a typical northern profile might look like, we should give the students extra flexibility to make up individual study profiles.

All Inuit professionals with KSB want to take more university courses and they have also clearly stated that they would like to do this on a part-time basis, for their work is very important to them. They are not willing to take courses just for the sake of getting credits. We have to develop new courses for them just as this was necessary at the certificate level and these courses have to be offered in the north.

There are now twenty-eight graduates from the Kativik-McGill Teacher Training program and all but two of them are this year actively involved in northern education as pedagogical counsellors, course instructors, program developers, administrators, special educators, and teachers. At least half of them want to continue studying towards a bachelor degree. We think it crucially important that the stability they are creating within our education system be recognized and encouraged by universities through arrangements whereby special courses can be developed, part-time study in the north is facilitated, work experience can earn university credits, and each student is allowed to make his personal study interests a legitimate component of an academic profile.

The Kativik School Board report 1978-1985 gives details on all areas of operation and can be obtained from Debbie Astroff, Kativik School Board, 305 Mimosa Avenue, Dorval, Quebec, H9S 3K5 — telephone (514) 636-8120. Articles by Cram and Stairs, in this volume, are particularly relevant for readers of this contribution (ed).

CHILD OBSERVATION PROJECT — INUIT TEACHER TRAINING (COPITT), 1979-1985

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1.0 COPITT origins

During the fall of 1978, the Kativik-McGill teacher training program recognized the need for course content dealing with educational testing, diagnosis and assessment. (See *What is the Inuit Teacher Training Program?*, Kativik School Board, 1978 for history of the Kativik-McGill teacher training program up to that point.) McGill instructors such as myself had been offering this content off-campus to practising teachers in various regions of Québec, with some degree of course adaptation to immediate regional needs. I was convinced, however, that needs of northern Inuit educators differed by orders of magnitude beyond any possible adaptations of southern qallunaat material. Perhaps the only value of southern educational evaluation methods and standards might be for older Inuit students eventually wishing to compete in southern educational programs. Very little formal knowledge existed concerning the learning style and pace of young Inuit children, whether being taught in Inuktitut or their second language. I suggested strongly that introducing southern primary-level testing and assessment methods to Inuit teachers would be not merely irrelevant, but possibly damaging, to both their own and their students' progress.

Only an action research approach, beginning with Inuit teachers' observation of their own children's learning and development, seemed appropriate. The proposed approach would involve (a) collaboration among a multidisciplinary group of southern educators, and experienced Inuit teachers and counsellors, (b) trial and error cycles in developing observation methods and interpreting their outcome, (c) direct involvement and training of Inuit classroom teachers as the observers in this action research, (d) immediate usefulness of the observational work to each classroom teacher herself, and (e) later usefulness of accumulated observations in curriculum and material development, in teacher training courses, and in decisions regarding policy, philosophy and style of Inuit education. (See original COPITT proposal, submitted January 1979 to Ministère de l'Éducation du Québec-MEQ, Kativik School Board, 1979). The COPITT project was accepted and funded by MEQ, essentially as proposed, for a 3-year period. Since then COPITT has been supported as an ongoing function of the Kativik School Board.

2.0 COPITT goals

2.1

Any effort to monitor educational progress opens the issue of basic developmental goals for children and their school system. From the COPITT perspective, the goals for northern native education are not simply attainment of some "southern standard". The following goal statements are provided to clarify the project's stance within the northern education scene.

2.1.1 Competency goals for an educated Inuk child

a) The child's competence, sense of identity and worth as an Inuk; close links between school, home and cultural community in his education; comfort, enjoyment and best developmental use of his time in school; preservation and extension of his language and culture and ties with the wider Inuit world, plus

b) positive integration with qallunaat culture from a position of Inuk cultural strength; wide ranging life choices in education and professions; an awareness, tolerance and capacity to deal with both Inuk and qallunaat cultures.

2.1.2 Self-sufficiency goal for the Inuit educational system

The self-determination and self-sufficiency of Inuit educators in operating an educational system to obtain the above competency goals, and others that may evolve.

This goal implies Inuit development in all roles and levels of the system —classroom teachers, specialists, teacher instructors, administrators and planners, researchers — with no more reliance on external expertise than that needed by people everywhere for highly specific skills and information.

2.1.3 Cultural-linguistic implications of competency and self-sufficiency goals

Accumulating evidence shows that high degrees of competence and self-sufficiency derive from comprehensive quality native-language education in the early school years. This positive evidence concerns not only first language acquisition and maintenance, but later second language, intellectual and social-emotional development (see Stairs, 1980). Beyond the very salient feature of language, education based on Inuit perceptual skills, thought patterns and values, and social interaction processes is implied. The education of educators as well as of children must consider these culture-specific features of teaching and learning.

2.2

In serving these goals COPITT has a *continuing research role*, as an integral part of the school system, at four levels.

2.2.1 *Direct observational research* of Inuit child development in all domains: perceptual-motor, linguistic, cognitive, and social-emotional.

2.2.2 *Program evaluation research* tied to teaching methods, materials, settings and policies being developed.

2.2.3 *Culture-context research* concerning the evolution, contact pressures, maintenance and linguistic viability of Inuit culture in Québec.

2.2.4 *External background research* concerning other native and minority educational situations in Canada and elsewhere, and communication with these other groups and projects.

Clearly in a small rapidly changing system such as Kativik, only certain aspects of certain levels receive full emphasis at any given moment.

2.3

The ultimate aim of COPITT research is *to provide information* to those in application and development roles within Inuit education.

2.3.1 *Consultants and counsellors* designing curriculum program sequences, materials.

2.3.2 *Teachers and specialists* assessing student needs and providing special education services.

2.3.3 *Administrators, instructors and advisors* providing teacher training and degree-level university education for Inuit personnel.

2.3.4 *Policy-makers* determining language of instruction and educational structures for an Inuit school system.

3.0 COPITT work stages, 1979-1984

Initial COPITT priorities were determined by Inuit counsellors involved in the project. "Why do our children not read until 8 or 9 years of age, while southern children begin at 6 years? Is it because our language is difficult, or because of the way we teach?" (Annahatak, 1978). This specific concern lead to a general decision at the first COPITT meeting to begin developmental research at the readiness and early primary levels rather than in one specific learning area (e.g., mathematics) across a wide age range.

In the first several years, most progress was made in observation of perceptual and motor skills. The marked strength of visual skills among Inuit children was confirmed, and program developers began building and refining a reading curriculum capitalizing on this strength. From 1981, there was an increasing focus on language acquisition, involving a combination of Inuktitut linguistic study and developmental study of children's language samples from 5 to 12 years-of-age. A hearing-screening project was set-up over the same period to begin coping with the very high northern incidence of otitis media and related learning disruptions. In a less formal way, thinking skills were studied in designing a basic concept scheme for early Inuktitut mathematics. Similarly, study of the social-emotional characteristics, needs and problems of Inuit children began through a course session, prepared and taught by Inuit instructors, for teachers and school counsellors.

From these beginnings with isolated and analytic (piecemeal) study of the child, current COPITT projects as described below (4.0) are moving into more holistic study of the child's relationship to his educational context. We feel this is a shift towards a more Inuit research perspective — perhaps from "Child Observation Project" to "Culture Observation Project". The greatest factor in this evolution of COPITT has been the expanding interest and changing roles of Inuit in educational research, and the consequent shifts in consultant perceptions and methods.

4.0 COPITT research and development projects 1985-1986

4.1 Evaluation of early Inuktitut-first-language education

Systematic evaluation began during the 1984-1985 school year, focussing on children then in grades 3 and 4. These levels include the oldest students who received Inuktitut instruction based on a well-developed language and literacy curriculum for kindergarten and grade 1. Inuktitut instruction has varied greatly among settlements in terms of grade level and percentage of Inuktitut-language teaching, formality of program, and preparation of teachers. Documentation of these school variables, and of other settlement factors such as second language television, population changes, and economic projects, is nearly complete. Writing samples have been gathered from all grade 3 and 4 students and have been analyzed for length and complexity indices established in an earlier pilot study (Crago & Annahatak, 1985). High correlations were found between these linguistic indices and proficiency ratings by experienced Inuit teachers and counsellors. Rating by four Inuit educators is also being done with the current writing samples for further correlational study and development of native-speaker language acquisition categories.

Writing sampling was selected as the top level Inuktitut language skill of interest to educators and communities, but broader study of proficiency, in both Inuktitut and second language, is planned for later in the year. This study would focus on selected settlements and individual cases, and would involve oral communicative as well as cognitive competence in content areas such as mathematics, science, and basic problem-solving (verbal and non-verbal).

4.2 Loss and maintenance of native language and the role of native language literacy

Documentation is underway concerning loss and maintenance of Inuktitut from west to east in Canada and other circumpolar regions, and of language loss experiences among native populations elsewhere in the world (information to date presented to Arctic Québec communities during Education Services round trip, winter 1984-1985). Particular attention is being given to the role of education in the cultural dynamics of native language maintenance. Native language literacy is well-documented as a key factor in language survival, and in both individual development and cultural evolution (see Stairs, 1985a, 1985b).

4.3 Kindergarten screening project

During 1984-1985, developmental screening was carried out for the first time with all Kindergarten children in Kativik schools. This screening was built on the child observation work done in conjunction with Inuit teacher training courses since 1978 (see Stairs et al., 1983). Over the years observation methods appropriate to Inuit children and teachers have been designed and revised, with further revisions resulting from this comprehensive screening. Kindergarten screening is being repeated this fall and is anticipated to continue in following years. Early identification of children with developmental lags or learning disabilities is a primary purpose (12 children identified in 1984-1985). Results are accumulated and integrated with past years' observation to provide a baseline for subsequent developmental research with Inuit children; to examine settlement differences and historical changes; and to study cultural specifics in perceptual, motor and language skills preceding formal schooling. Screening materials for 1985-1986 are now in the hands of Kindergarten teachers.

4.4 Methods for observing Inuktitut language development and proficiency levels

Attempts to evaluate Inuktitut proficiency (a language which had not been studied developmentally until the COPITT project began) evolved from (a) a fragmentary psychometric (testing) approach (discrimination, articulation, and receptive-expressive usage items), to (b) a language-sampling approach using conventional linguistic analysis, to (c) an ethnographic (descriptive) approach. Cultural inappropriateness of earlier approaches in terms of content, testing context, and language functions was discovered repeatedly. Currently a major ethnographic study of language acquisition by Inuit children in their home settings is underway (related to PhD thesis project of the COPITT language consultant). Goals of this study are the development of more appropriate language-teaching methods in Inuit schools; more realistic methods for observing language levels, strengths and weaknesses; and some theoretical work concerning accepted language universals which may be confirmed or challenged by the findings. This study will continue for a minimum of 2 years.

In conjunction with this ethnographic work, COPITT is searching for an interested scholar or consultant to continue earlier linguistic analyses using the new language material collected. To date, a children's (5-12 years) glossary of several hundred words has been initiated, and a number of key developmental structures have been identified.

4.5 Professional roles and native identity

Over the past year, the conflicts between (a) increasingly demanding professional roles in the educational system and (b) identity in the Inuk world, have become a highly-focussed concern among Inuit counsellors, consultants and administrators (see Annahatak, 1985). Issues involve differences in style and community role for an Inuk and a qallunaaq doing ostensibly the same job; locus of control and decision making; interactive patterns between Inuit and qallunaat; the use of Inuit language and conceptual patterns in originally qallunaat institutions. Background study is beginning concerning mental health problems among Inuit in bridging positions between Inuk and qallunaaq cultures, and concerning professional training programs that have succeeded or failed under various circumstances. Several Inuit counsellors are interested in continuing this documentation work and in beginning interview studies and community observation of these identity issues. This work should begin systematically during 1986 in the form of tutorials or special projects within Bachelor level programs of a few Inuit counsellors. One goal is to work with higher education institutions to design programs appropriate to the existing professional and community commitments and to the learning style of leading Inuit educators. A second goal is to develop professional training within the school system (teachers, counsellors, others) which incorporates Inuit values, social patterns and language and reduces the culture conflict of those educating the present generation of Inuit children (see *Kativik School Board — McGill University Inuit Teacher Training Program*, 1985).

Three further research and development projects are in planning stages, to begin late in the 1985-1986 year or the following year. The first concerns *Inuit concept acquisition* and cognitive mapping relevant to the presentation of mathematics and science in the northern schools. This work has been proceeding slowly since 1979 in conjunction with development of a primary Inuktitut mathematics program. More concentrated and systematic study (e.g., verbal and non-verbal classification studies) is now needed. The second project, also in progress but in need of consolidation, is a comprehensive *history of COPITT research work*, and presentation of the model evolving for educational development in a minority native context. Stages of personnel development, native language curriculum and materials development, and categories of ongoing research are to be documented. The interaction of these components as they determine the role of education in a culture-contact situation is the fundamental concern. Finally, there is interest in the study of *Inuit child development stages.* Counsellors would explore developmental concepts with adults of various ages, trying to describe an Inuit model of life stages and maturity which they believe exists. This model would serve as an alternative to southern (western) developmental models (e.g., Piaget, Erikson) in guiding some further child observation research.

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Note

Arlene Stairs could not attend the ACUNS meetings in Yellowknife. This paper was recommended for inclusion in the Proceedings because of its relevance to education in the N.W.T. Dr. Stairs is extremely interested in 'networking' with others in this field (ed).

THE IMPACT OF EARLY PRIMARY INUKTITUT-LANGUAGE EDUCATION IN KATIVIK SCHOOLS: PHASE 1, 1984-1985

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1.0 Purpose

Language of instruction in the early primary grades is a key educational and political issue in Northern Québec schools. Research from many minority and native language programs elsewhere are showing developmental advantages and later academic success for children who learn in their mother tongue during the first 3 years of school (Cummins, 1981). Northern Québec differs in some ways from the situations studied; opinions in the population vary; and local research evidence on the language policy issue is lacking. Systematic study begins here with an attempt to first describe the Inuktitut strength and characteristics of school children in the various Northern Québec settlements. Grades 3 and 4 were chosen as the initial group for study since these are the oldest children to have experienced, in varying degree according to settlement, Kativik-developed Inuktitut-language programs in their early years. Information gained in the present study concerning Inuktitut proficiency and characteristics will then be compared with proficiency in second language and other learning areas during Phase 2, 1985-1986, and hopefully in several subsequent years. Comparable research with Navajo students in the United States (Rosier & Holm, 1980) suggests that the effectiveness of early first-language schooling can be safely judged only at the end of elementary school. By 1988 when this current group reaches that educational stage, researchers hope to have a rich picture of their learning in both languages and various skill and content areas. So little is known about Inuktitut proficiency that it was felt necessary to start with this investigation of relevant language variables and characteristics. Unlike many bilingual evaluation projects, the maintenance and strengthening of first language is as much a concern here as strong acquisition of second language.

2.0 Method

The first step of the study was to document the teaching history in each settlement, beginning from 1978-1979. Information gathered included language(s) of instruction each year in kindergarten, grade 1, grade 2, and in higher grades if taught by an Inuk teacher; experience, educational background and counsellor judgment of teacher quality; and materials available. In addition, information was collected concerning settlement features and events during the same years which might affect quality of Inuktitut learning (e.g., English language movies and television).

Subjects included grade 3 and 4 students from all Kativik schools except one disrupted by a fire during the 1984-1985 year (see Table I). (One school had no grade 3-4 students in 1984-1985.)

Settlement	N	%
Settlement 1	41	23.7
Settlement 2	28	16.2
Settlement 3	22	12.7
Settlement 4	18	10.4
Settlement 5	16	9.2
Settlement 6	16	9.2
Settlement 7	14	8.1
Settlement 8	10	5.8
Settlement 9	7	4.0

Table 1. Grade 3-4 student population by settlement.

The use of an Inuktitut writing sample from each student was selected as the first data-collection method for several reasons. Writing represents the last-acquired and highest level language skill (after listening, speaking, and reading). Inuktitut is one of the most literate native languages in Canada (Stairs, 1985); writing is a valued skill in society as well as in school; and uses of the written language are expanding. There is evidence that native language literacy plays a key role in the learning of individual children and in cultural survival of the language. From the practical perspective of personnel, time and money limitations, large scale work with writing samples was immediately possible, whereas audio recording analysis and other language evaluation methods were beyond current resources.

An 8-page story book was prepared, each page with a picture and blank lined space for writing. Teachers were informed about the study and given specific instructions for gathering the writing samples. Using a series of large coloured pictures corresponding to those in the booklet, teachers discussed the story in class the day before writing. Children did their writing in the booklet without further help or instruction.

Once gathered by the researchers, the children's writing was broken into "chunks" (morphemes) for counts of numbers of expressions, clusters per expression, chunks per cluster, and affixes per root. These length and complexity indices were established in a previous pilot study of children's spoken Inuktitut (Crago & Annahatak, 1985). Independently, each sample was rated by 4 experienced Inuit teachers or teacher-counsellors. The rating was done without knowledge of the child's name, age or settlement.

Following rating, descriptive work was done by the Inuk researcher to begin definition of additional language features distinguishing high-rated from low-rated stories. Features sought spanned the range from technical writing skill, to syntax, to content and style. Writing patterns characteristic of different rating levels were described, and representative samples were selected. Contrasting paired samples of adult Inuktitut writing in several categories — story narrative, instructional exposition, factual reporting, debate — were collected for later exploration of pattern differences and historical changes in written Inuktitut. The validity of initiating such study with the judgments of native speakers experienced in Inuktitut language teaching and analysis, as opposed to beginning with conventional linguistic models, was established in earlier developmental work in Inuktitut (Crago & Annahatak, 1985).

3.0 Analysis

Two analytical approaches were used.

a) Correlational study was made of inter-rater reliability, inter-correlation of length-complexity indices and ratings, and relationships between these dependent variables and age, grade, sex, and settlement. ANOVA tests of significance were carried out for significant variation in ratings and the 4 language indices, followed by Scheffe tests of paired comparisons for each variable.

   Settlement differences in average rating of the writing samples were compared with a general index of early Inuktitut teaching quality in each settlement. This index was based on the training, experience, and counsellor evaluation of kindergarten, grade 1, and grade 2 teachers who had taught those students now in the grade 3 and grade 4 study sample. Teaching quality for each grade (3 or 4) for each of their first three school years (kindergarten, grade 1, grade 2) was categorized into three levels (scored 0, 1, or 2). Thus for each settlement, the quality of teaching index for this study might range from 0 to a high of 12 (i.e., a maximum score of 2 for each of the first three years of both grade 3 and grade 4 cohorts).

b) Descriptive study began with one Inuk rater of the stories defining the language features on which she had based her ratings. Given the bilingual situation of Inuit schooling, features of syntax and discourse which she considered Inuit in style — as opposed to English-based in structure and content — were particularly emphasized. From this checklist of features for each writing sample, in combination with quantitative expression and cluster data, several distinct writing patterns were described for further study.

4.0 Results and discussion

4.1 Inter-rater reliability

Agreement among the 4 raters of the writing samples was high (alpha reliability coefficient = .93, F = 9.05, $p < .00001$). Correlations between individual pairs of raters ranged from $r = .86$ to $r = .63$. From this result, the average rating was accepted for use in all further analyses. The average rating correlation with individual length-complexity indices ranged from $r = .58$ for number of expressions to $r = .38$ for affix/root ratio. These correlations differ from those seen in the pilot study of oral language samples where number of expressions negatively correlated with rating, while affix/root ratio showed the highest correlation. The more varied nature of the oral sample (age, ability levels), as well as differences in judging oral and written language, might be explored to elucidate these differences.

4.2 Grade differences

Number of expressions, chunks per cluster, and affix/root ratio showed no significant differences between grade 3 and grade 4 subjects. The number of clusters per expression did show significant difference between the grades: grade 3 averaged 5 clusters and grade 4 averaged 6 clusters per expression ($F = 12.83$, $p < .00001$). Work with younger and older children might further explore this apparent developmental progress in expression length. Average ratings given grade 3 and grade 4 writing samples were not significantly different. Given these results grade 3 and 4 subjects were included together for the initial analyses presented here.

4.3 Sex differences

Girls wrote significantly more expressions and used more clusters per expression than did boys (2-tailed $T = -4.19$, $p < .0001$ and $T = -3.12$, $p < .002$ respectively). In number of chunks per cluster and in affix/root ratio there was no significant sex difference. As described below, this may indicate a sex difference in fluency but not in complexity of writing. The average rating of girls was higher than of boys ($T = -4.02$, $p < .0001$), suggesting fluency as well as complexity were considered in rating. This finding is similar to that in many cultures showing superiority of female verbal skills in this age group.

4.4 Intercorrelations of length-complexity indices

Highest correlation was seen between chunks per cluster and affix/root ratio ($r = .68$, $p < .0001$). High correlation was also seen between expressions and clusters per expression ($r = .43$, $p < .0001$). Cross-correlations between members of these pairs was substantially lower or non-significant (ranging from $r = .26$ to $r = -.03$). This pattern statistically and logically, suggests two sets of related variables. One set emphasizes fluency: expressions and clusters per expression. The second set emphasizes length and probably complexity of syntactical structures: chunks per cluster and affix/root ratio. Settlement results as follows further support a meaningful difference between these two sets of indices.

4.5 Settlement differences

4.5.1 Ratings and length-complexity indices

Average ratings and length-complexity scores for each settlement are presented in Tables 2 and 3, ranged in order from highest- to lowest-rated settlement. Significant variations among settlements were seen in all four indices (expressions $F = 5.12$, df 8/161, $p < .00001$; clusters per

	Average Rating	Number Expressions	Clusters/ Expression	Chunks/ Cluster	Affixes/ Root
Settlement 9*	2.32	19.0	7.3	5.9	1.48
Settlement 8	2.27	19.0	7.0	5.2	1.54
Settlement 5	1.77	14.4	5.7	4.9	1.52
Settlement 7	1.73	9.6	4.3	6.0	2.03
Settlement 1	1.62	11.8	5.5	5.7	1.69
Settlement 4	1.56	11.5	5.3	4.9	1.44
Settlement 2	1.51	13.0	5.9	4.4	1.24
Settlement 3	1.37	9.1	5.1	4.4	1.39
Settlement 6	1.23	10.5	5.5	4.2	1.17

*Settlement 9 N small relative to other settlements
and subjects' age average higher

Table 2. Average rating and length-complexity indices by settlement (raw scores).

	Average Rating	Number Expressions	Clusters/ Expression	Chunks/ Cluster	Affixes/ Root
Settlement 9*	+ 1.16/	+ 1.06	+ 1.16/	+ .75	– .05
Settlement 8	+ 1.08/	+ 1.17/	+ .97/	+ .17	+ .09
Settlement 5	+ .23	+ .32	+ .07	– .09	+ .05
Settlement 7	+ .18	– .43	– .90	+ .88/	+1.26/
Settlement 1	.00	– .08\	– .03\	+ .59/	+ .45/
Settlement 4	– .10	– .13	– .21	– .09	– .14
Settlement 2	– .20	+ .11	+ .22	– .52\	– .61\
Settlement 3	– .43	– .51	– .31	– .54\	– .26\
Settlement 6	– .65\	– .29\	– .06	– .74\	– .79\

*Settlement 9 N small relative to other settlements
and subjects' age average higher

Note: Scheffe paired comparisons significant $p < .00001$ indicated by underlined valves.

Solid lines and dashed lines indicate separate comparisons.

Tail direction indicates high (______/ _ _ _ _/) or low (______\ _ _ _\) side of the given comparison

Table 3. Average rating and length-complexity indices by settlement (z-scores based on mean and standard deviation of all subjects).

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expression $F = 5.12$, $p < .00001$; chunks per cluster $F = 8.60$, $p < .00001$; affixes per root $F = 8.66$, $p < .00001$) and in the average ratings ($F = 1.92$, df 8/157, $p < .00001$). In all cases, as indicated in Table 2, Scheffe paired comparisons revealed statistically significant differences between one or two high scores and one or more low scores. Inspection of the data reveals clear differences between the indices emphasized in high rating and those emphasized in low rating.

High rating appears most based on fluency (expressions and expressions per cluster) as seen in the two top-rated settlements. Complexity indices (chunks per cluster and affixes per root) at just an average level are sufficient for high rating (e.g., Settlement 8).

Low rating appears most based on complexity (chunks per cluster and affixes per root) as seen in the two lowest-rated settlements. Even when combined with slightly above average fluency, low complexity scores keep the rating relatively low (e.g., settlement 2). High (settlement 1) and even extremely high (settlement 7) complexity scores do not raise the rating much above average if fluency scores are low or even average.

What appears in these findings are several markedly different fluency and complexity patterns of Inuktitut writing in certain groups of settlements.

4.5.2 Quality of teaching index

The quality and time of early Inuktitut teaching for grades 3 and 4 in each settlement are presented in Table 4. (No index can be calculated for settlement 9 since there is

	Teaching Index	Inuktitut Teaching Time
Settlement 9	—	
Settlement 8	9	Full-time Kg - Gr2
Settlement 5	3	Full-time Kg - Gr2
Settlement 7	4	Full-time Kg - Gr1/.15 Gr2
Settlement 1	3	Full-time Kg - Gr2
Settlement 4	3	Full-time Kg - Gr2 except .15 Gr2 for Gr4 cohort
Settlement 2	6*	Less than .50
Settlement 3	3	Full-time Kg - Gr2
Settlement 6	4*	.65 for Gr4 cohort .80 for Gr3 cohort

*Settlement 6 had considerably less and Settlement 2 very much less Inuktitut teaching time than other settlements.

Note: No index can be calculated for Settlement 9 since there is no Gr3 cohort.

Table 4. Quality of teaching index by settlement (based on Kg, Gr1 & Gr2 teachers of present Gr3 & Gr4 cohorts).

no grade 3 cohort). It is apparent that the highest level of average settlement rating corresponds to high quality full-time Inuktitut teaching (settlement 8). There is a sharp drop in rating with relatively little variation for all other settlements. This suggests that factors other than teaching quality are more significant to Inuktitut proficiency at all but the highest level. Further study of settlement factors during Phase 2 of this project may offer clues concerning these significant factors. It also appears that time of Inuktitut teaching, as well as quality, is important to writing proficiency. While the quality of teaching index is somewhat higher in settlement 2, teaching time is much less than elsewhere and Inuktitut rating is relatively low. Similarly in settlement 6, quality of teaching index is comparable to most settlements, but teaching time is less and Inuktitut rating is very low.

4.5.3 Writing features and pattern differences

Four patterns of written Inuktitut emerged from the combination of descriptive quantitative analysis of the grade 3 and 4 writing samples. While each of the patterns is particularly typical of one or two settlements, examples of most can also be found in other settlements.

Pattern 1. This pattern is mainly seen in the writing of students from the settlement with least Inuktitut teaching time and earliest introduction of second language (settlement 2). Quantitatively, fluency is average or slightly above, but cluster construction is very limited. Writing here is considered more second-language assimilated in its features than elsewhere. Perhaps most significant is a conceptual as well as a technical difference seen in the writing. Piecemeal statements rather than presentation of a global situation characterize the writing.

Pattern 2. This writing pattern is common in the two lowest-rated settlements, particularly in the settlement showing low fluency as well as limited complexity of clusters (settlement 3). Despite the weaknesses, this writing still often shows a relatively global Inuit-style presentation rather than isolated items. A similar pattern of writing is seen in some of the lowest-rated writing from many settlements.

Pattern 3. This pattern is typical of the two settlements significantly high in cluster complexity (affixes per cluster and affix/root ratio), particularly the settlement with a unique pattern of extremely long clusters with few per expression (settlement 7). Expressions are very comprehensive and flowing in style to an Inuk reader. Characterization in the writing is common and has been identified by the Inuk researcher as very typical of Inuit story-telling.

Pattern 4. This writing pattern is seen in the stories from the highest-rated settlements (settlement 9, settlement 8). Expressions are long and linked together, although clusters are less complex than in Pattern 3. Characterization and content are developed and vocabulary is rich. While the writing is well-integrated and stories are comprehensive, the style is less global and flowing than older Inuktitut.

5.0 Summary

1. Settlements vary significantly in the proficiency level of written Inuktitut in grades 3 and 4. Recognizing these variations will be important in interpreting results of second language proficiency study.
2. Writing does not only vary in level from settlement to settlement, but also differs in style. Four patterns can be described which have implications for teaching emphasis in Inuktitut curriculum and in teacher-training courses. Future study should face the issue of which patterns represent healthy language evolution, and which represent language loss or assimilation to second language.
3. A minimal length of cluster construction seems necessary for writing to be judged average at grade 3-4 level. Writing with less complex clusters is rated low. Writing with more complex clusters still receives average rating unless expressions are also long. Expressions composed of many clusters gives writing a high rating even if cluster length is only average. Clusters per expression appear to increase over the grade 3-4 range while cluster complexity does not.
4. High quality of teaching appears strongly related to the highest level of writing proficiency seen. Below that top level, factors other than teaching may be more significant to Inuktitut proficiency. Time as well as quality of Inuktitut teaching shows a relationship to rating of Inuktitut writing.
5. Experienced Inuit teachers agree closely in their proficiency judgments of student writing, and their ratings correlate with quantitative linguistic indices.

These written findings provide a basis for comparisons with oral Inuktitut proficiency and style, and both written and oral second language proficiency and style. Phase 2 of this study which is now in progress includes these language areas, as well as visual representation characteristics in children's drawings associated with their writing. While the primary purpose of this work is evaluating the impact of early Inuktitut education, a second focus is gaining importance as study proceeds. This second purpose is fuller understanding of the characteristics which make children's writing language, or drawing , and underlying conceptualizations, Inuk in nature.

This understanding is critical to evaluating the fundamental impact of formal education, whether in Inuktitut or second language, on the development of Inuit children.

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Note

Arlene Stairs and Betsy Annahatak could not attend the ACUNS meetings in Yellowknife. This paper was recommended for inclusion in the Proceedings because of its relevance for developments in Education in the N.W.T. The authors would like to hear from others in the field (ed).

NATIVE & NORTHERN TEACHER EDUCATION IN NEWFOUNDLAND & LABRADOR

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The development of Native and Northern Teacher Education at Memorial University has proceeded in two distinct directions. Programmes were developed in 1977-78 through consultation with, and through an advisory committee comprised of, representatives from the Federation of Newfoundland Indians, the Naskapi-Montagnais Innu Association, the Labrador Inuit Association, the Provincial Department of Education, and Memorial University of Newfoundland. One programme, the Teacher Education Programme in Labrador, addressed the needs of Native people, in designated Labrador communities, who expressed a desire to become qualified teachers; the other programme, Memorial University of Newfoundland Native and Northern Teacher Education Programme addressed the needs of any students who wished to combine an education degree with a specialization in Native and Northern Education. In addition to these two programmes, specific services have been made available on the St. John's Campus and on the Sir Wilfred Grenfell Campus in Corner Brook, Newfoundland, for native persons enrolled in regular University credit programmes.

Teacher Education Programmes in Labrador (TEPL)

TEPL is a field-based 20 course (2-year) diploma programme designed to prepare native teachers for designated communities in Labrador (See Table 1). The aim of the programme is to help provide opportunities for potential native teachers to develop professional skills and competence within their cultural setting.

Entrance into TEPL is through an application to the programme and a regular application to the University. Students must either have completed high school matriculation requirements, or be eligible to enter the University under the mature student clause.

TABLE 1 DESIGNATED NATIVE COMMUNITIES IN LABRADOR

Nain
Davis Inlet
Hopedale
Postville
Makkovik
Rigolet
Sheshatshit

Courses on the programme are shown in Table 2, and include such subjects as History, Sociology/Anthropology, Linguistics, English and Education. Included in the Education courses are a number of methodology courses and two courses in practice teaching. All of the courses are offered in Labrador and have been specifically developed to meet the needs of the native teachers. Due to cultural and linguistic differences, separate provisions for course offerings are made for both the Innu and Inuit/Native-Settler groups. Where feasible, courses may be offered to the Inuit in Nain, Hopedale, Rigolet, Postville, or Makkovik; and to the Innu in Sheshatshit and Davis Inlet. However, there have typically been fewer than two students located in either Rigolet, Davis Inlet, or Postville, making it unfeasible to offer courses in such

TABLE 2 COURSES ON THE MEMORIAL UNIVERSITY TEACHER EDUCATION PROGRAMME IN LABRADOR

History 1070	Canada's Native Peoples
Sociology/Anthropology 2220	Labrador Society and Culture
Sociology/Anthropology 3210	Persistence and Change in Rural Society
English 100C	Survey of the English Language I
English 101C	Survey of the English Language II
Linguistics 2020*	Structure of Inuktitut
Linguistics 2030*	Structure of Montagnais
Linguistics 2040*	Structure of Micmac
Education 2350	An Introduction to the Teaching of Mathematics in the Primary and Elementary Grades
Education 2182	An Introduction to the Teaching of Science in the Primary and Elementary Grades
Education 3321	Native Literature
Education 2222	Teaching English as a Second Language
Education 2250	Educational Psychology
Education 2361	The School and Community
Education 3140	Creative Arts
Education 3281	Tests and Measurements
Education 4330	Curriculum and Instruction in Native and Northern Schools I
Education 2200	An Introduction to Language Arts
Education 3001	Supervised Practice Teaching in Native Schools I
Education 3002	Supervised Practice Teaching in Native Schools II (prerequisite Education 3001)
Education 2230+	Teaching Strategies in Native Schools — Primary Level
Education 2240+	Teaching Strategies in Native Schools — Elementary Level
Education 2192	Physical Education in the Primary and Elementary Grades

*+One from each of these course categories

TABLE 3 COURSES ON THE MEMORIAL UNIVERSITY NATIVE AND NORTHERN TEACHER EDUCATION PROGRAMME

Required Courses:	
Education 2202	Education in Native and Northern Communities—An Overview
Linguistics 4010*	An Introduction to the Cree Language
Linguistics 4020*	An Introduction to the Inuttut Language
Linguistics 4030*	An Introduction to the Montagnais Language
Linguistics 4040*	An Introduction to the Micmac Language
Education 4330	Curriculum and Instruction in Native and Northern Schools I
History 3809	Contemporary Issues in Historical Perspectives — Canada's Native Peoples
Education 4430	Seminar — Current Issues in Native and Northern Affairs
Sociology/Anthropology 2220	Labrador Society and Culture
Education 2222	Teaching English as a Second Language
Education 3670	The Culturally Different Child
Three Electives from:	
Education 3081	Communication Skills and Techniques in a Cross-Cultural Environment
Education 2245	Teaching Strategies in Culturally Integrated and Geographically Isolated Classrooms
Education 3573	History of Native and Northern Education in Canada
Education 2430	Administration and Supervision in Native and Northern Education
Education 3582	Education of Minority Groups
Education 4331	Curriculum and Instruction in Native and Northern Schools II

*One course only from this group

communities to date. This has resulted, particularly for the Inuit group, in some travel and temporary accommodations to access courses.

Most of the students on the programme are teachers-in-training (also known as teacher aides) working in Labrador schools with provincially certified teachers. The school boards have encouraged these native students to take the TEPL courses and work toward being certified teachers themselves. Typically, TEPL students have a number of years of experience as a teacher aide, and many are young married women with children of their own. This makes the practice of travelling to selected communities to take courses (often of six week duration) much more difficult, particularly for the Inuit/Native-Settler TEPL students for whom courses are usually offered in one of three communities in a given semester.

Approximately six courses are offered each year, two each semester, to each of the Innu and Inuit groups. These courses may be of either six or twelve week duration depending on different circumstances: for example, when students are required to travel from one community to another, or instructors have to be re-located to teach a course, then the six-week accelerated format is used.

Flexible scheduling of courses is used with respect to dates and times of class meetings to best accommodate local situations and conditions. Also, every effort is made to supply students with course material, such as textbooks, in advance of each course for pre-reading and study purposes. The courses are taught in English rather than either of the two native languages. Enrollment in the courses is typically restricted to students in the TEPL programme.

Instructors for courses are either recruited from qualified people at Memorial University, or where possible, from Labrador communities. Selecting instructors is a challenging task: while it is important they be well qualified, it is essential they be sensitive to the special situation of the designated native communities and the students in the programme. Instructors are counselled by the Co-ordinator of Native & Northern Education prior to the beginning of a course, and put into contact with a resource person (on-campus course co-ordinator) with whom they can make weekly contacts concerning all aspects of the course. This latter procedure is particularly important when instructors are not regular members of the Faculty at Memorial. On-campus co-ordinators are also encouraged to make an on-site visit to the course, while it is in progress, to further assist the course instructors. Additionally, provision is made for course instructors to provide individual tutorial time for each student in a course. Also, more recently, TEPL graduates have been utilized as resource people for selected courses.

The number of students in the TEPL programme is relatively small. To date approximately 50 students have been admitted, of whom nine have now graduated and five have transferred into regular degree programmes at Memorial using TEPL course credits for advanced standing. The remaining students are at various stages of their programmes, although it should be noted that not all students take courses on a regular basis. The number of Innu versus Inuit/Native-Settler students in the programme is about equal.

Upon completion of the 20 TEPL courses, students receive the Diploma of Native and Northern Education and become eligible for a Provincial Grade II teaching certificate and employment within the school system as teachers rather than as aides.

Memorial University of Newfoundland Native and Northern Education Programme (MUNNTEP)

MUNNTEP is an 11 course diploma programme designed to prepare students for teaching assignments in native and northern communities. It offers specialist training to students who have completed, or are enrolled in, an education degree programme offered on the main campus of Memorial University. In addition to the courses, students are also required to complete an internship in native and northern education as part of the Diploma requirements. Courses on this programme are shown in Table 3. They are open to all students.

Unfortunately, there has been little response by students to this programme, and as a consequence of this, none of the courses is offered at the present time. A recent survey of teachers of a Labrador School Board revealed little interest in MUNNTEP.

Administration of programmes

Both TEPL and MUNNTEP are part of the Division of Special Programmes and both programmes are administered through the Director of Special Programmes, the Co-ordinator of Native and Northern Education and the Dean of the Faculty of Education at Memorial University. Courses in both programmes carry regular University credit. The Innu and Inuit communities, school boards, and government agencies are involved in an advisory capacity. This is accomplished through an Advisory Committee which has representatives from the native associations, the Department of Education, Memorial University, and the local school boards. All aspects of the programmes, particularly TEPL, are discussed at regularly scheduled meetings which are usually held in Labrador.

The Co-ordinator of Native and Northern Education is also assisted in the organization of TEPL courses and instructors by two field co-ordinators in Labrador; one for the Innu Group, and one for the Inuit/Native-Settlers. Part of the responsibility of these Field Co-ordinators is to maintain contact with the native students, help arrange local accommodation for instructors and students when necessary, suggest persons as possible course instructors, and maintain regular contact with the Division of Special Programmes.

Funding

Funding for Native and Northern programmes is provided jointly by Memorial University and a federal/provincial native funding agreement. This funding is administered through the Division of Special Programmes with respect to programme operations and administration costs. Student support costs, on the other hand, are provided by and administered through the Department of Rural Development-Labrador Services Division.

On-campus students

Native students from Labrador who are enrolled in regular University programs on campus in St. John's and those on the Corner Brook Campus are assisted by the Division of Special Programme's Co-ordinator of Native and Northern Education with respect to such things as obtaining suitable accommodations, registering in courses, obtaining books and supplies, advice on courses and programmes, and personal counselling. The Co-ordinator also acts as a liaison person between the student and the Provincial Department of Rural Development which administers student maintenance and travel costs.

Within the Faculty of Education, a room is also provided (the "Labrador Room") for native students. It is a place where they can conveniently meet and study together while on campus.

Future developments

Since a number of TEPL students are now graduating with the two year Diploma, consideration is being given by the Division of Special Programmes to the development of a suitable education degree programme for native people (Innu and Inuit/Native-Settlers) in Labrador. After consultation with native student teachers, TEPL graduates, local school communities, native associations, and community groups, through meetings and visits to Labrador, a committee was established by the Faculty of Education in February, 1986, with a mandate to develop this new programme and to incorporate into it the existing TEPL courses. The work of the committee should be completed during the Fall of 1986.

Already some of the TEPL graduates are representing their communities and school districts on both the TEPL Advisory Committee and on the Committee developing the new programme. It is also anticipated that more of these graduates will become involved in the teacher education process as resource persons who are able to enrich the course offerings and assist course instructors.

Summary

Memorial University of Newfoundland is actively involved with native teacher education, particularly with respect to providing qualified native teachers for native communities in Labrador through the TEPL programme. The desire exists among students, as well as graduates of TEPL, to be well prepared teachers who are employable within their respective school jurisdictions.

As planning proceeds for the ninth year of operation of the TEPL programme, changes are being implemented which, it is anticipated, will result in a degree programme specifically developed for the native students who wish to continue their University education beyond the 20 course context of the Diploma in Native and Northern Education.

DISTANCE EDUCATION AND THE NORTH

DISTANCE EDUCATION AND THE NORTH

This Section is based on a Workshop at the ACUNS meeting in Yellowknife, chaired by Jim Carefoot (University of Regina), Co-Chair Lorne Smith (Government of the N.W.T.). There was great interest in the topic which deals with an area of Education in which changes are occurring very rapidly. The Chairman, in his report which follows this introduction, has provided names and addresses of participants so that readers may contact those involved directly.

As Michael Owens and others point out, although Distance Education has great potential in the North, it is no panacea. Most Distance Education students in Canada reside in urban areas where they benefit from a variety of support systems which are not available for isolated northerners. Nor is Distance Education a cheap solution to educational problems in remote areas.

Nevertheless, Distance Education (ranging from the well established methods of correspondence courses to the most sophisticated satellite systems), properly used, can meet some northern needs. And, there is, in Canada and abroad, ample experience to be drawn on.

This Section contains introductions to Distance Education in Canada from coast to coast. References provided in the articles allow the reader to tap the wealth of resources available in Canada where Distance Education was and is the norm in many communities. The ACUNS report, *Distance Education in the Canadian North: An Annotated Bibliography, 1984,* might also be useful in this regard.

Appropriately, the Distance Education Workshop included two satellite presentations which were followed by question and answer sessions involving the presenters and the group in Yellowknife. One of these was from Alaska, the other from Newfoundland. Both of these are jurisdictions which have great experience with education systems in 'northern' environments, involving native and non native peoples. The State of Alaska, notably the University of Alaska, has a very well developed Distance Education system which is of great interest to northern educators and students. The Province of Newfoundland maintains an education system which encompasses remote areas of the island of Newfoundland and Labrador. Memorial University, through, for example, its High School Extension Program and its Labrador Institute in Goose Bay, has played a major role in developing education in remote northern communities.

The articles in the Section begin with a contribution from the Territories and then proceed across the continent from Newfoundland to Alaska via Ontario, Manitoba, Alberta and British Columbia. Pierre Patry, of Télé-université, Québec, also provided a most interesting presentation which, unfortunately, is not available to us here. Télé-université was created in 1972 as a part of the Université du Québec system. It is a degree-granting institution whose mission is to reach people in Québec who cannot obtain a higher education by traditional methods. Its courses are primarily print-based but include audio cassettes, T.V., interactive T.V., electronic mail and computer services. The public telephone service is used for teacher/student contact. The University also has audioconferencing facilities. In 1986, 28,000 student courses were offered, the equivalent of 2,400 full-time students. Television and radio instruction is via CANAL and Radio Québec. The former is a non profit television consortium in Québec involving a variety of educational institutions, cable and broadcast companies, etc. Through CANAL, ten hours of french language instruction per week are now available, across Canada, on the CBC's parliamentary channel. Further details can be obtained from M. Patry whose address is given in the following article.

REPORT ON DISTANCE EDUCATION WORKSHOP, ACUNS' MEETINGS, YELLOWKNIFE, NWT

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Definition for distance education

— for the purpose of this discussion, it was agreed that learning where the student and teacher are separated by distance most of the time is distance education. A further condition of time independence is usually accepted.

Participants' expectations

The participants were asked to take a few minutes and write down what they wished to achieve. A summary of their expectations follows:

1) Participants wanted to learn about the cost of distance education.
2) Participants wished to learn about the capability, experience, methods, materials and technologies used and available for distance education.
3) Participants wanted to gain insight into the application of distance education to their particular field such as, training of librarians, archivists, museum personnel, community workers.

4) Participants wanted to be able to liaise with institutions so that distance education can grow in the north. Of particular interest was liaison between the Arctic College and southern institutions.

5) Participants were skeptical about the ability to design curriculum for northern needs. They wished to learn about curriculum development.

6) Participants were very interested in native education programs using distance education.

7) Participants expressed concern about standards and credibility of distance education programs.

University and regional profiles

Each panel member outlined program and opportunities and needs in their part of Canada and how that may relate directly to the north. As well, panelists had prepared papers for the workshop which appear in these proceedings.

The primary issues raised include:

1) The north requires both facility and infrastructure to support distance education. Universities can assist by providing support and advice in both areas. A network team might be identified to provide advice on distance education.

2) It is essential that programs maintain flexibility. A consortium approach based on northern needs whereby the north can benefit from southern programs, where applicable, create its own open university and exploit existing resources was suggested.

3) Awareness about distance education is a major problem. Planning at the community level to promote and develop distance education must occur.

4) There is a need for pre-university distance education material. As well, there is a need to integrate various distance education modes with face-to-face interaction in the north. Instructor development and support services will be required.

Workshop conclusions

ACUNS can play a leadership role as follows: ACUNS should explore the creation of an inter-university/Government of Northwest Territories/user advisory panel on distance education development.

Its tasks may include:

— identification of relevant materials and expertise for application particularly in the early grades relating to culture, language and geography.

— identification of a working committee to assist with coordination and implementation of distance education in the north.

— identification of a working group including appropriate university officers so that northern students will be able to accumulate credits towards a recognized degree from several sources (credit bank or educational legacy).

There was consensus that:

1) universities should continue to offer and develop courses both for professional development and credit in the north.

2) universities must apply their research capacity to the identification of appropriate curriculum and delivery methods for the north.

As a substantive practical step for distance education, a "showcase" program for the north utilizing the capacity of the C.B.C. parliamentary channel is encouraged.

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DISTANCE EDUCATION MUST BE GOOD FOR US, BECAUSE WE SURE GOT LOTS OF DISTANCE

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Background

The Northwest Territories covers an area of 3,376,698 km², approximately 1/3 of the total land mass of Canada. With a population of 50,000, the population density is only 1 to 67 km². By southern Canadian standards, there are no large towns or cities. The largest centre is the capital city of Yellowknife, with 12,000 inhabitants, while most settlements have fewer than 1500 people.

Transportation is primarily by air, although there is a highway system in the southwestern portion of the N.W.T., and the Dempster Highway from the Yukon serves Inuvik and some of the other Mackenzie Delta communities. During the short open water season, barges and ships resupply most coastal and Mackenzie River communities with fuel oil, heavy equipment and other bulk supplies. Transportation is expensive because of the distances involved, and the general high costs of operating in the far north. Weather is an important factor in all transportation plans, and causes delays, inconvenience and sometimes danger to travellers.

Most communities receive CBC television via satellite. Other services are not available, and some of the newer satellites are aligned to serve the northern United States, and Canadian border area with the result that coverage to the North is limited or non-existent. Telephone service is available in most communities, but may be only a single radio phone in some of the smaller settlements.

Major economic activities are: Non-Renewable Resource Exploitation, and Government Services. For the Native population, the traditional income sources of hunting, trapping, and fishing remain important, if marginally profitable, activities. Handicraft and art production is a steady source of income for many families. Lack of education and/or job skill training limits the ability of many N.W.T. residents to enter into the labour force in a meaningful fashion.

Of the 50,000 residents of the N.W.T., some 58% are Native Canadians. However, in the 1985/86 school year, of a total of 590 students enrolled in university or technical training, only 90 or 15% are of native ancestry. Although the situation is improving it is apparent that the native majority takes less advantage of/receives less from or is unable to benefit from post-secondary education or training.

The potential value of distance education

From the above, it would appear that Distance Education is a "natural" for the N.W.T. We have a small rural population scattered over a wide area, with a limited transportation and communication network. Institutions of higher learning are far removed from most of the population, and even many school children are unable to take high school in their home community. Many adults are anxious to take advantage of job opportunities available, especially in the resource field, but because of limited training and/or education are often unable to fill any but the most unskilled jobs. The costs involved in putting on satellite courses, or developing and maintaining education facilities are very high.

The most optimistic predictions of Distance Education suggest individual students working at their own pace, from their computer terminal, calling remote data bases, and using their computer controlled lazer disc viewer to learn Brain Surgery 313, Automobile Tune-up procedures or what have you. While these predictions are well within the realm of possibility, the present state of affairs is more likely to be correspondence courses supplemented by teleconferencing, audio tape lectures, video taped instructional materials, and lots of reference books, textbooks, and course notes!

Distance education in the N.W.T.

Although Distance Education would seem to have great potential value for the delivery of education programs in the N.W.T., there has been less use made of this means of instruction than one might expect.

Not all government officials and/or educators have a clear understanding of what Distance Education is, and what it can do. For example, short term courses conducted on location in some remote community by a fly-in-for-2-weeks instructor, or using educational television in a regular classroom to supplement a teacher's lesson are seen by some to be Distance Education. While arguing over definitions may not seem important, those who direct the work of others should at least have some understanding of what is possible. Also, there is danger in assuming that because we have lots of distance, Distance Education will solve all our problems. Clearly, information must be presented to explain what Distance Education is, what it can and cannot do, and what costs are involved. In an education system as diversified as that which exists in the N.W.T., no one approach to education/training, will be best in all situations.

Some of the factors which suggest a need for Distance Education, are the same conditions which make it more difficult to install a Distance Education System for the delivery of instruction! For example, the broadcasting of Educational TV programs/courses, is often economically viable only in large, densely populated areas. In fact, it is in large, urban areas where people already have access to colleges/universities/adult centres that much Distance Education is carried out, because the per capita costs are lower. We cannot afford a satellite channel and a dish/rebroadcast system for all 72 communities in the N.W.T. Even if it were possible, this would not necessarily be the best way to provide instructional programs throughout the N.W.T.

Although Distance Education has not been used to its full potential in our system, there are many courses available to N.W.T. residents. Teachers regularly take correspondence courses to upgrade their qualifications, there are nursing refresher courses, Knowledge Network programs are received in some settlements and are available on Video Tape in others.

While "hardware" is a problem in using Distance Education in the N.W.T., a far more serious problem is "software" unsuitability for the majority of the population.

Successful completion of a course of independent studies requires considerable discipline. It also requires that the student have sufficient skills to be able to use and understand the course materials. At present, most of the courses offered through Distance Education in the N.W.T. are university courses designed for the upgrading of professional skills. The students taking these courses are most often professional people used to "book work" and study, they already "have it made". The people who are most in need of education/training to enable them to enter the work force, or upgrade their educational level do not have sufficient skills to take the training that they need to even get a foot in the door. In addition to a low level of basic education, many N.W.T. residents are not fluent in English, and have a reading comprehension level at the Grade 4-5 level. There are also many older people who are unilingual in one of the Amerindian languages or Inuktitut.

The instructional programs which would be most useful to us in the N.W.T., would be those in basic education — arithmetic, and language skills, geared to adults whose first language and culture is not English. In addition, training programs are required in specific job skills relating to resource industries and other local activities. Because many people are now involved in running their own businesses, short courses on bookkeeping and other general business courses are also required for these local entrepreneurs. But again, these courses must take into account the education/language level of the students. We cannot simply take a southern designed instructional program and put it "out there" and expect people to benefit from it.

General guidelines for distance education in the N.W.T.

Some general principles should be kept in mind in planning for Distance Education in the N.W.T. These include the following:

1. Students are more likely to be successful when they are not "on their own". Therefore students should be able to work and learn with other students, even if they are taking different courses.
2. There should be a local "facilitator" to arrange space, set up teleconferencing units, and handle the other organizational tasks. Although Adult Educators are logical people to handle this, there are only 37 Adult Educator positions in the N.W.T. at present. Part time, trained local people could function as facilitators.
3. Highly sophisticated technology is great as long as it works. However, in the N.W.T., your local serviceman may be 2000 km away. Getting faulty equipment repaired can be a frustrating process resulting in long delays for the students. In order to reduce dependency on outside delivery systems, courses that arrive as complete packages, with books, tapes, reference materials etc. are to be preferred to those that are dependent on the transmission of individual lessons from some remote site at a fixed time.
4. Students need to have contact with the instructor. In most situations, teleconferencing, or the ability to phone the instructor for help, would be the most practical means of receiving assistance. Timing of sessions would have to be flexible, in order to avoid the problems that can arise from phone break-downs due to weather, satellite problems, or jammed lines.
5. Course materials must be geared to the abilities and interests of the students. A significant number of students may require course delivery in one of the

native languages. Course offerings should also have practical value related to employment opportunities.

6. Distance Education should be used to deliver instructional programs only if it makes sense. This means that there must be some advantage to using Distance Education rather than a more conventional teacher/student situation. Will Distance Education be cheaper? will it result in a higher success rate for students? will it allow students to take courses they cannot take in other ways? will Distance Education be affordable? would it be preferable to hire additional instructors and use face to face teaching methods? Given the need for student contact with some support personnel, it may be cheaper and more effective to increase the numbers of adult educators in the settlements, give them added support, and exploit human adaptability to tailor course and content to the needs of the student, than to install and maintain an expensive mechanism for the delivery of Distance Education that will require the student to adapt to the system.

7. Producing courses to be delivered by Distance Education methods is a costly, and time consuming process. Existing course materials must be adapted to take advantage of the delivery system being used, or new course material must be produced. The production of course materials/learning packages, especially those involving video, is an expensive business, in terms of equipment, materials and labour. Additional costs in installing the delivery system are also a factor, particularly when high tech systems such as satellite transmission are involved. Ongoing communications expenses must also be considered. Some of the course development costs can be reduced by entering into cooperative production projects with other education jurisdictions, or by buying off the shelf materials.

Two models for the delivery of Distance Education

The first model links the course instructor with the student by using one or another of the available technologies. This might be as simple as phoning the instructor, or as elaborate as two-way, interactive television. The student(s) and instructor must be available at the designated time. It is also preferable that there be a number of students in one place taking the course so that there can be interaction among the students. A local "facilitator" to make the necessary arrangements is also a very positive addition to the learning environment.

The disadvantages of this model is that the student is still bound by time constraints. Job or other demands on the person may prevent him attending some or all of the lecture sessions. Certain external and uncontrollable factors also act as barriers. For example, is a phone line available? are there "clear" atmospheric conditions? are there white out or blizzard conditions? was the repair man able to get in from a few hundred km away to repair the "gizmo" that broke two weeks ago? There is nothing that will kill the desire to learn faster than missing a lecture a few weeks in a row because the phone lines are all busy, or the signals are down.

The second model is also dependent on technology, but the course is sent as a package or series of packages. This way, the materials for the course can be made available prior to the time that they are required by the student(s). The delivery of the material can still use high tech methods. For example, microcomputer data or information could be sent by modem and telephone line. An auto answer system at the producing end would allow students to access the system on a 24 hour basis without the need to have personnel onhand. Video tape materials could be sent by satellite at an "off hours" rate. The use of a timer would allow the recording of the programs without the need of someone operating the recorder. The materials would then be available for use by the student at any time.

The delivery of lesson materials in this way would permit students to schedule their own learning. It would still be desirable for them to meet as a group, with the facilitator. The instructor should also still be available by phone or some other way, as a resource. Learning would not be so dependent on the proper functioning of some externally administered delivery system, while at the same time, use of technology would speed up the distribution of materials to the learning sites.

The role of educational technology

In addition to the needs of the adult population for education and training, the inschool students also stand to benefit from the development of Distance Education systems. As part of Department of Education general policy to extend the level of education offered in a student's home community, and reduce the need for Residential Schools, levels of education have been extended to Grade 9 in most communities, and to 10 and soon to 11 in others. This creates difficulties in offering an adequate range of courses in small communities where there may only be 12 to 15 High School students and one teacher. Any technology introduced for the purpose of Distance Education Delivery, for example Educational TV, would also be of enormous benefit to the teacher in the school, or the local adult educator. Learning packages for Distance Education, if in academic subjects, would also be useful to the student in the regular school program, whether as a supplement to a teacher delivered program, or in a self study setting with or without teacher assistance.

Given the costs involved and our small population, any systems installed to support Distance Education must be used to support the inschool/adult program as well. We simply cannot afford to have an expensive system dedicated to one segment of the population — the student learning over distance.

Distance Education is already being used in the regular school program to allow students to enroll in courses that they would otherwise be unable to take. These courses are available through the Alberta Correspondence School, and students can receive full credit on successful completion. The delivery of these courses could be enhanced by hiring "tutors" who would be available to assist students in person or over the phone. These tutors would be on call at certain prearranged times.

Other technologies are also in the system, these include microcomputers, video tape units, and projectors. There is great potential for these teaching/learning tools, particularly for such things as microcomputer communication systems, however to date, the potential has not been realized.

Summary statement

Producing courses to be delivered by Distance Education methods is a costly, and time consuming process. Existing course materials must be adapted to take advantage of the delivery system being used, or new course material must be produced. The production of course materials/learning packages, especially those involving video, is an expensive business, in terms of equipment, materials and labour. Additional costs in installing the delivery system are also a factor, particularly when high tech systems such as satellite transmission are involved. Ongoing communications expenses must also be considered. Some of the course development costs can be reduced by entering into cooperative production projects with other education jurisdictions, or by buying "off the shelf" materials.

Course materials and delivery systems can also be used to support the traditional classroom instructor, by providing supplementary or course materials to assist in the delivery of the regular program, or to provide instruction in subjects the regular teaching staff is not qualified to deliver. These spin-off benefits may be sufficient to support the establishment of a system that could not otherwise be justified.

Given the need for student contact with some support personnel, it may be cheaper and more effective to increase the numbers of adult educators in the settlements, give them added support, and exploit human adaptability to tailor course and content to the needs of the student, than to install and maintain expensive Distance Education technology that will require the student to adapt to the system.

It is important that Distance Education be seen as being just one more way of delivering an instructional program. It has advantages and disadvantages, is well suited to certain situations, but is not a cure-all. And it certainly is not likely to come cheaply.

Note

Lorne Smith was Co-chair of the Distance Education Workshop at the ACUNS Yellowknife meetings (ed).

DISTANCE EDUCATION AT MEMORIAL UNIVERSITY

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The Division of Continuing Studies at Memorial University serves the part-time student through Summer Session, the Evening Program and the Distance Education Program. In the Summer and Evening Programs, courses are delivered in the traditional classroom setting and the delivery methods for courses offered in these sessions are, I am sure, quite similar to those in universities throughout the world. The teaching in Distance Education courses, however, differs significantly from regular on-campus teaching, and in the remainder of this brief informational note, I will describe the various formats used at Memorial.

Before elaborating on distance education courses, I should, first of all, outline the off-campus organization of Continuing Studies. In the province, this Division has three Regional Offices which are located in the larger towns of the Province. Under each Regional Office are centers of learning where students meet for class, view video-tapes, attend teleconferencing lectures and write examinations. Each center has a part-time coordinator who is the University administrator for that center. There are forty centers which range in size from five students to 250 students. The total off-campus enrolment in any semester is 2,000 students. These 2,000 students are teachers, nurses, police officers, businessmen and women, politicians and housewives. Courses are delivered to these students using print, video-tape, live instruction, teleconferencing and by a combination of print, video-tape and teleconferencing.

Correspondence courses

The print-based or correspondence course consists of a number of written or audio lectures. The course manual also contains an administrative section which includes a course overview, the texts used, reference material, a section on How to Study, the evaluation system and, at least, five assignments. These courses are thirteen-week semester courses and must be completed within the thirteen weeks. In some courses, a limited number of teleconferencing sessions are held when students can interact with the correspondence instructor and other students registered in that particular course.

Video-tape courses

The components of a video-tape course are twenty-four video-taped lectures, a course manual and a book of readings. The video-tapes are forwarded to the learning center where students meet as a class and view the lectures. Examinations are written in the centers and forwarded to the University where they are corrected and returned to the students.

The advantages of video-taped courses are:

1. Large numbers of students can be accommodated when these courses are offered in a number of centers.
2. Students can review lectures at a time convenient to the student.
3. Video-tape is an excellent delivery method for courses which require visual demonstration. A course in Physics or Biology, for example, adapts very well to this medium.
4. Well-known authors or experts on particular subjects can be interviewed.
5. Lectures are usually well-organized and contain good, solid presentations.

The disadvantages are:

1. These courses are expensive to produce.
2. Very often, a good proportion of the lecture is a talking head unless the production budget is substantial.
3. Television is a passive medium.
4. Feedback to students is usually very slow.
5. Technical problems sometimes frustrate students.
6. Lectures are sometimes compressed and contain too much material.
7. The production time usually extends over a lengthy period of time.

Teleconferencing can overcome some of these disadvantages and, in my opinion, the combination of video-tape and teleconferencing improves the quality of distance teaching.

Teleconferencing courses

Some thirty instructors have now taught teleconferencing courses and, I suppose, it is fair to say that each one has responded differently to this delivery system. Most have drawn on their regular classroom experience and adapted their presentations as they became more familiar, and more at ease with, what we commonly call the system. Various time frames have been tried. In the beginning the 3 hour class modelled on the on-campus situation was the most prevalent. This, as you proably know, is a tiring and demanding experience and because of this, we quickly shifted to two sessions per week — each 1 1/2 hours in length. In recent years, another transition has taken place and most instructors now use 1 1/2 contact hours per week supplemented with print, audio-tape lectures or video-tape lectures. This was based on the assumption that straight-forward lecture information can be delivered by print or audio-tape. So now a course manual plus other supplementary material is usually mandatory for a teleconferencing course.

Video-tape has been used extensively in teleconferencing courses both as supplementary material and an integrated part of the lecture. In a business course, for example, twelve different films were used. The films were dubbed on video-tape and forwarded to the various centers. The instructor then used this video-material to generate class discussion. The tapes provided some variety to the lecture and served as a motivating factor for discussion. The teleconferencing system works best when it is interactive and this, of course, is one of the strong features of teleconferencing. With dialogue from teacher to student, the learner is engaged and a satisfying atmosphere usually or sometimes associated with the teaching process becomes apparent. This interaction is more important in the electronic classroom than in the regular classroom because you do not have the usual *visual clues* to tell you that you are interesting or boring or that you are or are not getting your point across.

Video-tape has also been integrated into the lecture. English 2400, a course in the History of the English language, was produced before the telewriter was purchased. A visual component was essential and the instructor used short segments of video-tape for the necessary visual component. The course monitor started and stopped the tape on cue from the instructor in somewhat the same way a blackboard would be used. In the regular classroom, face-to-face communication was used to teach the concept. In teleconferencing, he used the video-tape.

These two particular examples illustrate the necessity and importance of planning and preparation — a preparation that is, more than likely, beyond what is required in regular classroom teaching. All instructors who have used the teleconferencing system have stressed the necessity for this up-front preparation.

With this stress on structure and preparation, I do not want to create the impression that the system is not a flexible one. In fact the teleconferencing system is very flexible and provides teaching opportunities not usually associated with regular classroom teaching. Panels, guest lectures, interviews with authors and an assorted variety of techniques can be used. Various writers have stressed the importance of variety, and variety maintains interest and motivation.

Besides using video-tape and audio-tape to increase variety in lectures, slides and overheads can be used. Some universities, like the University of Ottawa, use the electronic blackboard which is quite similar in principle to the telewriter used at Memorial. The telewriter or long-distance blackboard is essential for mathematics and science courses. It also serves as a focal point for the students in the off-campus learning centers.

This brief summary, then, represents the efforts at Memorial University to bring its vast resources to the small and large communities in the province of Newfoundland.

Note

This contribution to the ACUNS meetings in Yellowknife was made by satellite (ed.).

DISTANCE EDUCATION: A NORTHERN SOLUTION?

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I Lifelong learning: the new reality

This is a time of substantial technological change, requiring a commitment of lifelong learning, both for the acquisition of new skills and to transform old experiences into new meanings. The information economy is replacing the industrial economy, with a resulting shift in the educational prerequisites for employment. This requires an intelligent choice of technologies that will serve not only economic and strategic goals but also long-range social and ecological objectives.

Knowledge is power, but now the field of knowledge is expanding by leaps and bounds so the life span of some professions is being measured in years instead of decades. Lifelong learning has become a necessity. Education is considered to be the answer for a rapidly changing world, while at the same time it is an area affected profoundly by societal changes. Universities are being subjected to growing social pressure to respond favourably to the demands of adult education.

Computer-assisted learning packages are being developed, courses are being taught by audio cassette, by television, by teleconference — the field of distance education has expanded as fast as new technologies have appeared, with the promise of ever greater potential through developments such as satellite transmission, video discs, video-teleconferencing and two-way interactive telidon.

Distance education has also expanded because of human pressure, as people's lifestyles have demanded more flexibility. While many students learn at a distance because they have no choice (home or job commitments or unavailability of programs), many choose to learn outside the traditional classroom environment because of unpleasant memories of childhood learning experiences or the challenge of self-directed learning.

"Distance education" can be a misleading term and in fact requires only the tangible separation of the learner and the tutor. Within that broad construct lies a variety of possibilities, including correspondence study, interactive television and teleconferencing. The actual distance may be as much psychological as physical. Administratively, distance education requires substantial and senior internal institutional support to be successful, mainly because it requires a marshalling of the institution's human and capital resources and because the bulk of its costs are up front.

The development of distance education in Canada generally and at Laurentian University specifically provides a valuable foundation for assessing current initiatives and options for the future.

II A brief history of distance education in Canada and Ontario

Contrary to popular thought, distance education is not a rural phenomenon. It began in the industrial cities of nineteenth century England, Germany, Scandinavia and the United States. Only in Canada and Australia, where large areas of land are still sparsely populated, do many distance education strategies show learners and tutors working at great distances. In Canada by far the majority of registrations are still to be found in urban centres because strategies increase access and provide more flexible methods of learning than are provided in traditional classroom-bound contexts. Sixty per cent of the University of Waterloo's distance education students live in urban areas.

Before the turn of the century, Queen's University had begun its program of correspondence courses, which, in conjunction with its summer school, permitted adult students (mainly teachers) to earn a degree. This model was subsequently adopted by many other Canadian universities. The University of Toronto used correspondence preparation for some of its summer school courses. The need to provide for a uniform standard of education across provincial borders led to the development of print-based distance education courses by professional organizations.

University involvement in these programs was at first concentrated in Queen's and the University of Toronto. Within many professional groups and particularly in the various organizations of accountants, print-based course training became a requirement even for university graduates preparing for professional examinations. Concurrently, similar programs were also being developed and used by provincial agencies for primary and secondary school students and for vocational training.

The late 1960's and early 1970's saw the birth of a large number of distance education facilities, including the Tele-Université du Québec, the Open Learning Institute of British Columbia (OLI) and Athabasca University as well as a variety of provincial communications authorities such as ACCESS/Alberta, TVOntario and the Knowledge Network of the West (KNOW).

More recently, in March 1984, the ministers of education of British Columbia, Alberta, Saskatchewan, Manitoba, the Northwest Territories, the Yukon and the Federal Minister of Inter-Governmental Affairs signed a letter of agreement to create a Distance Education Committee to consider collaborative development and acquisition of distance education materials. In September 1984, the British Columbia government created the Open University Consortium including all provincial universities, KNOW and OLI. In Atlantic Canada, the Atlantic Provinces Commission on Higher Education created the new position of Director of the Office of Educational Communications. The Atlantic Provinces Association for Continuing University Education was granted $20,000 by the Ministry of State for Science and Technology for a project entitled "Consortial Atlantic University Programming on the Personal and Social

Impacts of Technological Change". In late 1985, the government of Manitoba gave one million dollars to the University of Manitoba to develop its distance education program.

In Ontario in 1982, the Council of Ontario Universities (COU) commissioned a review of distance education delivery of university-level programs. Following the report, COU created in March of 1983 a standing committee on distance education to encourage cooperative developments in the field. In Ontario 12 of 16 universities are currently engaged in some form of distance education for undergraduate degree credit, graduate work, professional upgrading or designation and career development. Leaders in the field include Wilfrid Laurier, the only on-going producer of broadcast-quality material (4 courses on air), the University of Ottawa, with an extensive audio-teleconferencing program, the University of Waterloo, with over 20,000 yearly registrations in its audio-cassette correspondence program, and Laurentian University, with a multi-media based bilingual program offering degrees in three disciplines. Although it is difficult to establish directly comparable figures, estimates are that over 30,000 Ontarians are served through university level distance education programs. The 1982 Snowdon Report estimates that in the short run 25,000 - 30,000 additional Ontarians are likely to be attracted to new distance education programs.

Considering the constraints on the existing university system which show no signs of improving, this alternative form of education is well worth examining, not only for part-time but also for full-time study. A judicious combination of traditional and distance education formats holds a promise for lifelong learning.

III Distance education at Laurentian University

Laurentian University was created in 1961 to serve the needs of Northeastern Ontario, a geographic area twice the size of France, with a current population of 650,000. The university is the major partner in a system of on-campus federated church-based colleges and affiliated university colleges in Sault Ste. Marie, 300 kilometres west of Sudbury, Hearst, over 600 kilometres north and, North Bay, 120 kilometres east. Undergraduate degrees are available in Arts and Science, Engineering, Social Work, Commerce, Education, Nursing and Human Movement. Graduate programs are offered in Arts, Science and Business Administration. Many programs are offered in English and French.

Envision, Laurentian's Distance Education program, began in 1972 as an innovative attempt to bring university courses to a scattered population with no tradition of university participation.

Currently, Laurentian has over 60 courses available via print-based correspondence, audio-cassette, television, video-cassettes in learning centres in 25 communities and teleconferencing. Degrees are available in English in Psychology, Law and Justice, and Religious Studies. An additional degree in Sociology will be completed shortly. In French, a total of ten courses are offered in various subject areas, with a major expansion effort underway. The university produces over 90% of the courses it utilizes. Two courses have been produced in collaboration with TVOntario and several other universities. Some are leased from other universities. It is Laurentian's policy not to duplicate course development wherever possible.

Recent changes in the development process will incorporate a course team model, including three content experts, an instructional designer, course editor and graphic designer. As part of the process, the Centre for Continuing Education, which administers the program, has produced a distance education course development manual to provide guidelines for all courses and is planning faculty workshops on course design. Overall academic responsibility for courses rests with the Senate Committee on Continuing Education.

Northeastern Ontario has special educational needs which can be addressed via distance education. The area incorporates many small, isolated communities which are single-industry towns, based on the primary resource industries of mining and forestry. Participation rates in university programs, although increased significantly with the presence of Laurentian, are still lower than provincial norms. As well, levels of high school completion are lower than in the South.

The population of Northeastern Ontario is 40% francophone. Here participation levels are even lower and the university, through the Centre for Continuing Education, is currently developing a series of non-credit bridging programs delivered via distance education. Similar programs are being developed in English and are being considered for the area's large native population.

Continuing professional education is essential for individuals in teaching, social work and nursing. Laurentian was a founding member of the Northeastern Ontario Telehealth Network, which links over 30 area hospitals by audio-teleconference. The university has added several additional sites and now has a dozen separate locations set up. Bridging is done through Darome equipment at NOTN. A pilot project has just concluded successfully and plans call for a minimum of three courses next year, including an introduction to social work, in French.

Since its inception, Laurentian has attempted to service various off-campus communities with traditional face to face instruction. Over the years, over 40 different communities including Moosonee, 600 kilometres north, on James Bay which can be reached only by rail or air, have hosted courses and on occasion complete programs. However, in the last few years Ontario has slipped to 9th place in provincial government support to universities. Being new and bilingual, Laurentian has experienced significant financial difficulties as it attempted to fulfill its regional commitments. During the last year, off-campus programs ran in 18 communities, with the majority of the courses offered in education (français). The implementation of teleconferencing will hopefully reverse this trend, as fewer students are required for financially viable programming. Normally the university requires approximately ten students for face to face instruction whereas distance education courses by teleconference require only five students. In other distance education courses, faculty are paid for each student who registers, so no courses are cancelled, no students are disadvantaged.

Laurentian also believes that some courses are best offered by television and has been a leader in educational telecourse production. When the university decided costs were too great to continue independent production, proposals were initiated to work co-operatively with TVOntario and sister institutions. One series has been completed and a second is now underway. These programs are then aired on the provincial network, increasing access.

Much interest has recently been generated by a feasibility study for the provision of Laurentian's unique Post-RN BScN degree using an innovative blend of distance education methods and technology with face to face instruction on satellite campuses. Central to the success of the program will be the development of a network of clinical experts throughout the North who are qualified to supervise the practical component of the degree. The Telehealth Network will be utilized fully.

Critical to the implementation of any sound distance education program is an understanding of the many aspects of course development and design.

IV Course development and design

Distance education, because of the separation of teacher and learner, requires a different approach to course design. As well, the experience and learning objectives of adult students have had some impact on the design process. In many cases this may require the reorganization of course material itself, as the emphasis switches to the learner.

Distance education course design is in itself a subtle professional development exercise for faculty members. The design process incorporates a collaborative model so, for possibly the first time, a faculty member may find him/herself working as part of a design team, with other members including both content and process experts. In this model, learning objectives must be specified and course development must adhere to these objectives. It has been the experience of learning designers that this process impinges favourably on classroom teaching. The final result of the course team, multi-skill process carrying out formative evaluations is a high quality product. Members of the team include a content specialist/writer, an instructional designer, and audio-visual producer, an editor and a graphic designer. Even more interesting, evidence suggests that the course work produced by the learner is as good as, if not better than that produced in classrooms.

The development of a distance education course generally follows a specified sequence. First, the course material is divided into obvious units. Learning objectives are then established for each unit. These objectives should be sequential, with each unit building upon those preceding it, integrated with the course material as a whole, relevant to the overall objectives of the course and achievable. Each unit should provide a number of opportunities for the student to test his or her progress in achieving the objectives, either through self-assessment or instructor/tutor evaluation. The learning process itself should be evaluated by the student and the tutor to ensure that it is suiting both the student's needs and the course requirements. Finally, at the conclusion of the course, all aspects of it should be evaluated in terms of intended learning outcomes.

Not long ago, studies of distance education activities stressed "the loneliness of the long distance learner". This is changing as course designers increasingly build into the course a series of meetings, either in person, by phone or by audio-teleconferencing. Studies have proven that this form of contact cuts attrition significantly and enhances the learning experience.

V Costs and benefits of distance education development

There are many misconceptions associated with the development of distance education programs. Universities assume either that costs are prohibitive or that they are so low that quality education cannot result. The truth is far more complex and involves difficult questions of institutional reward systems, and the societal responsibility of universities.

Faculty participation in continuing and distance education initiatives is difficult to ensure for two reasons: first, development fees are normally not in line with external consulting fees and second, this participation is at best, not considered, at worst, considered negatively, for tenure and promotion. An exception to the latter situation exists at the University of Guelph, where both the quality and quantity of continuing education participation are considered.

In addition to the cost of faculty resources other development costs include the personnel on the course team, the rental of supplementary material (including copyright clearance) travel and honoraria. Distance education is not "education on the cheap", neither is it as exorbitantly expensive as it may appear at first glance. Costs for distance education courses are front-end loaded, but because of careful planning of course materials, these costs may be amortized over an expected five-year lifespan of the course. It is virtually impossible to compare cost across programs and technologies.

Of far greater significance to the university than the cost of individual course development is the question of what the university loses in terms of its reputation for leadership, excellence and innovation, opportunities for research, and opportunities for staff development if it continues to restrict its teaching activities to the classroom. Such restriction is clearly no longer appropriate to adults locked into busy working lives and coping with the stresses of overwhelming social and economic changes.

VI Strategies for the future

As more post secondary institutions become involved in distance education, increasing financial resources are brought to bear on development work. Unfortunately, this more often than not results in significant duplication of effort. In an attempt to halt this duplication the Canadian Association of University Continuing Education has for many years published a distance education directory, copies of which are available from AUCC (The Association of Universities and Colleges of Canada). As well, the Council of Ontario Universities now publishes a similar booklet for Ontario only. These directories allow sister institutions to see at a glance what has been produced elsewhere and, hopefully, to consider utilization of existing courseware instead of duplication. It is at best a passive form of collaboration which in Ontario is now assuming a more active form through various initiatives of the Council of Ontario Universities Distance Education Committee.

Over the last four years, provincial and federal governments have shown increasing interest in distance education. Talk of "rationalizing" development has been prevalent, and several initiatives to this end have already occurred. Co-operation and collaboration on course development will no doubt assume increasing importance. However, while it is remarkably easy for universities to discuss co-operation, it is remarkably difficult to make it happen. Guidelines for collaborative development of courses do not exist.

In the meantime, several private companies are expanding their activities to include distance delivery of an existing or new product. The Campion Language Institute has created high quality packages in several languages with course development work being done by university faculty across Canada. Northland Open University, operating under federal letters patent and not accredited by AUCC, has initiated an aggressive marketing campaign, offering bachelors degrees in commerce and engineering, while its affiliate, the Canadian School of Management, offers MBA's. The universities of Canada may be assured that poor quality production and presentation of distance education material will not be accepted by an increasingly sophisticated market. Again, if we are unable to afford quality production singly, collaborative development simply makes good sense, in a competitive marketplace.

The obligation to do quality work extends to the area of substance, not simply form. A glossy kit of materials which are not well put together brings no credit to us. Every university which makes a commitment to distance delivery should also, must also, make a commitment to instructional design and the provision of services to those students who learn at a distance. No university should ever move into distance education simply because it is seen as a potential source of easy revenue — our traditions of excellence must extend to this highly visible form of education.

In order to enhance the stature of distance education within universities, we must integrate the course development process into our criteria for tenure and promotion. We must encourage and promote research in the field of andragogy, with special emphasis on distance delivery. Only by succeeding here can we raise the academic profile of course design. By extension, the quality of teaching on our campuses will also increase.

As we gain more experience working with various technologies, we will be able to make more considered judgements on the benefits of each to the learner. Some material lends itself to graphic representation, some to television production, while some requires the exchange of ideas possibly by teleconferencing or the face to face contact of the classroom. Possibly, judicious blending of technologies may be the answer, with courses including a print base, audio and video cassettes, teleconferenced seminars and face to face interviews between students and instructors.

Finally, as universities become increasingly aware of the need to open access to their programs in times of financial restraint, there can be little doubt that distance education truly democratizes access in a systematic, planned manner.

Note

The Council of Ontario Universities (130 St. George Street, Ste. 8039, Toronto, Ontario M5S 2T4, telephone (416) 979-2165) publishes a Calendar of distance education courses available in the Province. The 1985-86 version is entitled "University Education at a Distance, Opportunities in Ontario" (ed).

INTER-UNIVERSITIES NORTH, MANITOBA: "BRINGING THE UNIVERSITY TO YOU"

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In May 1979, a middle-aged female student from Thompson, Manitoba, graduated with her Bachelor of Arts degree from the University of Winnipeg. The occasion passed quietly, with no great fanfare, and yet it was a milestone for Inter-Universities North (IUN) — for that student was the first to receive her degree after fulfilling all the degree requirements by courses taken solely in northern Manitoba, courses offered by the three Manitoba universities. It was a milestone toward which IUN and all those involved in the Program had striven.

An attempt to meet the expressed needs of northerners by Brandon University, the University of Manitoba and the University of Winnipeg was what brought these three institutions together in 1969, but it wasn't until the University of Winnipeg actually delivered a psychology course in Thompson that year that Dr. Lionel Orlikow, the Human Development Assistant to the Planning and Priorities Committee of Cabinet, with the support of Dr. Lloyd Dulmage, President of Brandon University, called a meeting of the three universities (see Waines, 1978). It was at the urging of Dr. Orlikow that the push was made to co-ordinate the efforts of the universities in the Manitoba North. Of course, the problem was how to make post-secondary education, and particularly university credit courses, accessible to northerners whose alternatives were: to enroll in correspondence courses offered by the University of Manitoba or offered by a score of Canadian universities outside the Province, or to travel south to the campuses.

The problems surrounding these alternatives are all very well known and have been addressed over the past fifteen years. The result was that a co-operative effort in the matter of face-to-face distance delivery of university credit courses was undertaken; in fact, the IUN motto says it well — "Bringing the University to You". All three universities participated; funds to keep IUN going came directly from the Universities Grants Commission (UGC). Furthermore, and this was the most salient point of all, all universities agreed, through their Senates or equivalent body, to accept *all* courses offered through IUN *as their own*, that is, as fulfilling the student's own university's residency requirements.

From the beginning all three institutions divided the work evenly — one third of the courses offered by each university — so that the smallest (Brandon) took responsibility for as many courses as the largest (Manitoba). This arrangement continues even today.

Administration

The responsibility for the IUN program is given by the UGC to the Committee of Presidents of the Universities of Manitoba (COPUM), who, in turn, appoint a Senior University Officer (SUO) from one of the participating universities. As IUN was originally based at Manitoba in the Evening and Summer Extension program, COPUM eventually decided to assign a two-year term to the position of SUO and to rotate it. There is also a Director, the chief executive officer of IUN, who is recommended by the IUN Program Executive Committee (IUNPEC) to COPUM which makes the appointment.

The IUNPEC consists of the SUO, who is also the Chairperson, the Director (non-voting), and three representatives from the universities (each participating institution appointing one). This is the working committee, the body that decides finally what will be offered and where, and through whose efforts, combined with those of the various departments and Faculties, the search for and the hiring of instructors are made. Recommendations for policy changes are initiated by IUNPEC. Three main administrative responsibilities have been identified over the years and addressed: the library, registration and records, financial and comptrolling. Originally these were assigned one per university — library to Brandon; registration/records to Winnipeg, and financial-comptrolling to Manitoba. For a time in the late 70's all three functions were located at Brandon, but for various reasons it was modified so that library remained where it was, as did financial-comptrolling while the record-keeping was done by each university for its own students (copies to the IUN-Thompson office), and registration was taken over by the Director and the Committee of Registrars.

Faculty

Although IUN is an umbrella organization and hires no faculty of its own, the collective agreements of each university are in force as each instructor is employed by a specific institution. Teaching faculty is either ***full-time*** ("sessionals", a full teaching load, term contract) or ***part-time*** (less than a full load for the length of the course or courses). Instructors are sought and contracted by each university according to its own hiring practices, and may fall into one of the following categories: (1) live in the North and teach in own community; (2) live in the North and teach in another northern community; (3) live in the South and work on the campus of the institution sponsoring the course(s); (4) live in the South, within the province, and travel north; (5) live outside the province and move to the North. As a rule, northerners and sessionals teach in the evenings during the week while southerners travel on alternate weekends, holding classes on Friday evenings and Saturday mornings.

Library

There are funds in the budget — but never enough — to acquire and process books. Reference and other such materials are purchased upon recommendation of the instructors, although the IUN Librarian will sometimes have an input. The holdings have been increasing steadily — now numbering some 8,500 titles. This, of course, in addition to the extensive collections of the three co-operating institutions. The IUN library is housed in various northern communities and moved around from community to community as the courses require. Since the complete collection is computerized, it is quite an easy task to keep track of the individual books. In the communities themselves, the holdings are generally housed in the public libraries (to allow for accessibility by the general public), though where there is no public library, the texts, etc., are deposited in the local high school library.

Registration/records

In the early days of IUN, there was an IUN Registrar who was responsible for the registration, record-keeping, etc., for the program. In these later years, the registrar's duties have been assumed by the registrars of the participating institutions with the residual duties going to the Director. Of course, there is a committee of registrars and record persons who discuss and recommend changes in procedures, forms, etc., to the IUNPEC. The universities have taken over complete responsibility for grades, records, admissions, and the like of their own students, *i.e.*, the student's "home" university is that from which he/she expects to receive the degree; the "sponsoring" university is that which offers a specific course. For example, a student taking a B.A. degree at the University of Manitoba (the "home" university) may register in a course offered by Brandon or Winnipeg (the "sponsoring" university) and consider that course as if it were Manitoba's, thus fulfilling Manitoba's residency requirements as well.

Courses

Until the 1984-85 academic year, IUN has offered only in person face-to-face instruction. This year, beginning in September 1985, it has moved in a new direction. In conjunction with the three universities, IUN now also offers a number of teleconferencing courses. Some of these originate in the North and are taken up by other northern communities, while others originate in the South and are tied in both to southern and northern groups of students. It has greatly expanded the offerings, and it will facilitate the completion of degree programs because, until now, courses were offered only if there was an acceptable number of registrants. In some of the smaller communities it would have been virtually impossible to complete a minor, let alone a major, in an academic area. Now the possibility exists that enough potential graduates in a number of communities can together request a senior course.

An overview of the 1985-86 year

Our income is derived from three main sources: the University Grants Commission (Manitoba); student tuition (at $179 per 6 credit course); and a 15% administration fee which IUN charges to deliver arts elective courses to Northern Bachelor of Social Work Program (NBSWP) and Frontier School Division in Cranberry Portage. The total income from all of these sources is slightly over one half million dollars. From this, nearly 80% goes to pay the salaries and travel costs for 34 instructors (11 northerners) who deliver 42 full course equivalents (*i.e.*, 42 six credit courses) to 13 northern communities. The remaining funds are used to pay the salaries of the director, an administrative assistant, a secretary, and all the administrative costs incurred in running our Northern office, which is situated in Thompson, Manitoba.

Currently our enrollment figures show 621 registrations, 44% of which are new students. Note that nearly 30% of our courses are being offered by teleconferencing. Presently we are operating a (teleconference) network comprising six northern communities but this will expand to include 10 communities by Fall. A minimum of 5 students per site is required in order for a community to be eligible to receive a course using this delivery method and each community can choose from a total of 20 (University of Manitoba) courses. For on-site courses, IUN normally requires a minimum of 15 registrations per course, although this policy has sometimes been overlooked in the past. All of our courses are selected from the three (Manitoba) universities and every attempt is made to have equal representation, although this is not always possible. For the most part, each institution recognizes the courses of the other two, and the course equivalents are revised and published in our annual calendar.

The process by which courses are determined is usually an interesting blend of needs assessment and trial and error. This year, the emphasis has been placed on community development which has taken the form of:

a) a letter to community coordinators outlining how courses will be determined in consultation with the director;

b) a follow-up telephone survey to see how IUN could help with the local needs assessment;

c) a questionnaire (optional) which can be used to supplement other methods such as advertising, local meetings, etc.

By way of an example, 800 questionnaires were delivered door-to-door in Lynn Lake.

In spite of every attempt to systematize the process by which courses are selected for each community, there remains a weak spot in the selection process. It may not be obvious, but the quality and reputation of the professor has an important effect on registrations. In one example, a certain professor did not lose even one student who registered for his two classes, although he was only able to teach on Friday nights (4:30-10:30 p.m.). In general, our professors are interesting people, often experts in their field, who show a keen interest in the welfare of the people who live in the North. Fortunately for us, most of them have already indicated that they are willing to teach for IUN again next year, one positive sign that the system is working. Next to low enrollments (which is a function of fiscal policy), professor unavailability is the main reason a course would be cancelled.

More than ever, IUN is in a position to deliver a wide range of courses to students in Northern Manitoba communities. The reason for this, in large part, is due to distance education which as the name implies allows us to teach courses at a distance without an instructor actually being present. At the moment, teleconferencing is the preferred method of distance delivery, although correspondence courses are also taken by IUN students. IUN is an active member of the Western Canadian Committee on University Distance Education (WCCUDE) and the Canadian Association of Distance Education (CADE) and is in an attractive position to take advantage of new advances in instructional technology. On the other hand, teleconferencing is not a panacea and is not highly regarded when considering a class of more than 15 students. For the future, given that we serve the needs of many small communities, it is my hope that IUN will be among the first organizations to be able to offer a complete university credit program entirely by distance education.

The IUN Program Executive Committee recognize the need, on behalf of our students, for a strong foundation in basic mathematics and communication skills and therefore have proposed that these courses be part of each community's course offerings for next year. Due to the high cost of hiring additional sessional instructors to teach these courses, we are asking the University Grants Commission to provide us with additional funding for this special need, so that a full IUN program can be offered as usual.

Recently, there has been a flurry of activity in Northern Manitoba regarding a post-RN, Bachelor of Nursing Degree. IUN is a participant in the Swampy Cree Tribal Council feasibility study and plans to offer all the electives for a B.N. degree, should this study finally be approved. In general, this opportunity is being provided for Northern Native people so that the number of Native nurses working in Manitoba can be increased. In addition to this proposal, there is a Northern Nursing program already operating out of Thompson which delivers an RN diploma, for which IUN has been asked to deliver elective courses.

In sum, IUN offers, or has been asked to deliver, elective courses on behalf of four different organizations operating in Northern Manitoba: Northern Bachelor of Social Work Program; Frontier School Division; Swampy Cree Tribal Council; and the Northern Nursing Program. These efforts account for more than 10% of our total income and provide us with an auxiliary means of serving our Northern clients through other organizations. We also play an advisory role, through our educational advisor, to students who are taking correspondence courses outside of the province, usually from University of Waterloo or Athabasca University. There is no charge for this service; either to the student or to the university, since IUN recognizes that each student North of the 53rd parallel is our responsibility, whether or not they are registered at one of our universities. Of course, it is our intention to be able to serve their needs as best we can within the province. And we believe that we are succeeding in doing just that as illustrated by the fact that the number of enrollments and the number of courses have consistently risen over the years, since our inception in 1969.

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DISTANCE EDUCATION: THE NORTHERN EDUCATIONAL PANACEA?

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In a nation such as Canada, where distance is an omnipresent geographical and psychological fact, the principle of "distance education" holds much promise for the extension of post-secondary education in the North. However, the potential of distance education as a delivery methodology is, at times, thwarted by the many difficulties for the student and the institution. This paper will outline (1) the general notion of distance education and its applicability to northern Canada and (2) the experience of Athabasca University (AU) in delivering courses to northern students. Caution is tendered for those who see distance education methods and new technologies as panaceas for educational problems of the North. Distance education, as a series of delivery systems, has much promise for the widening of accessibility to secondary and post-secondary education in northern Canada but, as with other delivery systems, it must be adapted to the cultural, social, political and economic realities of the North.

What is distance education?

Distance education as an educational construct encompasses many different delivery systems. Distance learning systems range from simple correspondence courses to television and radio lectures to highly integrated print-based courses with television/radio, two way audio and video or slow-scan technology, or computer-assisted instruction components.

Most descriptions of distance education focus on the student, the learning materials and methods, and the logistical and economic features of distance learning systems (DLS). Kaye and Rumble (1981) contend that DLS enlarge educational opportunity to new target populations, previously deprived through geographical and social isolation, lack of formal academic requirements, or employment conditions. Second, DLS learning materials and methods are expected to be flexible in content and curriculum and are consciously and systematically designed for independent study. In addition, learning materials are expected to employ a wide range of media and resources suited to the needs of the students. Third, DLS offer greater flexibility for the learner than conventional teaching methods. Finally, the creation, production and delivery of learning materials have potentially "lower recurrent unit cost per student than that obtainable through conventional ... teaching arrangements and also potentially a considerably lower capital cost per student." (Kaye and Rumble, 1981)

Others claim that the key concepts of DLS are accessibility and flexibility. DLS should have open entry, individual pacing, effective counselling and instructional materials which are flexible enough to adapt to alternative modes of delivery and learning styles. "An open learning system is a system of support and resources that can adapt to meet needs in a far more flexible manner than traditional models." (Forsythe, 1984)

Why distance education?

Distance education is a potential solution to the problem of accessibility to post-secondary education in northern

Canada. Many individuals who desire to pursue a university or college course are denied the opportunity for reasons of: lack of formal qualifications, lack of educational institutions in their locale and demands of employment or family life.

Distance eduction is a series of delivery modes by which these barriers may be removed. Post-secondary distance education institutions usually have open entry policies. That is, adults who meet the minimum entrance requirements (in the case of Athabasca University, any Canadian citizen or landed immigrant who has reached the age of eighteen years) may enrol and undertake degree or certificate studies. In addition, such institutions have flexible enrollment dates (monthly, bi-monthly, etc.) which enable students to enter when it is most convenient for them to do so. Also, distance education institutions usually provide students with print-based course packages which contain all required course materials, including textbooks, study guides and workbooks. Occasionally, students are required to view television lectures or listen to radio broadcasts which supplement printed course materials. By providing students with the printed materials (and audio-tapes if required), the university enhances the opportunity for students to study whenever employment, familial duties or personal preference permit. Students may interact with the institution, via correspondence or telephone conversations with a "tutor", or computer-conferencing when they require assistance. Thus, DLS are adaptable to students. The home-study, self-paced instruction model permits students who are unable to attend a traditional university, for any reason, to study when they, not the institution, deem suitable. What could make post-secondary education more accessible to the isolated student, the employee or the full-time homemaker?

Proponents of distance education as an educational panacea for northern Canada argue that it is this flexible nature of distance learning systems that make them so attractive to educators, to politicians and to students. DLS may increase the availability of post-secondary education to client groups that have traditionally been denied access to this level of schooling. As ideological supporters of the notion that more people should be granted access to post-secondary training, many educators perceived distance education as a partial solution to the problem which confronts one client group — northern Canadians — who have not been able to access post-secondary training in the same way as their southern counterparts. Yet educators should study carefully the divergence of practice from theory before proposing distance education (or any other learning system) as a panacea for the problems encountered by a geographical region composed of diverse cultural groups.

DLS permit the isolated and rural residents to study for university degrees without the necessity of leaving their home community; office workers and labourers to obtain professional upgrading necessary for advancement without relinquishing their employment; early-school leavers to achieve a post-secondray degree or certificate; full-time homemakers or secretaries to obtain the education that they so-often forfeited for their families.

In a report on a survey of potential distance education clients in Ontario, Waniewicz (1979) identified the most-likely "Would-Be-Learners" as "females of age 25 to 34 who are married homemakers with children, and males 25-29 who usually are fully-employed young heads of families. From the point of view of occupations, Would-Be-Learners are most often found among clerical, white-collar workers, sales personnel, and unskilled labourers, who usually have inflexible hours of work." (Waniewicz, 1979). Thus, the opportunity to study when the demands of the family or the workplace are fewest is a boon to these self-identified potential learners. Canadians resident in the northern parts of Ontario, the Western Provinces and the two Territories have been perceived as another likely client group.

Proponents of distance education claim that northern residents could be among the highest percentage of "Would-Be-Learners". The claim is made that these individuals are the potential learners who have the greatest difficulty getting to courses which are often offered in southern urban centres or, occasionally, at regional colleges and regional high schools at times which are inconvenient. The North has few post-secondary educational institutions which offer degree-related programs or professional certification. Frequently, if a northern resident wishes to pursue a university degree it is necessary for that individual to travel to a southern institution (with added costs and the tribulations of culture shock). Too often, northern residents lack the formal educational qualifications to be enrolled in a university degree or professional certificate program. Thus, distance education institutions with their flexible entry requirements, emphasis on independent study (student-centred self-study packages, not instructor-centred classroom studies), and non-existent classroom schedules may be the solution to the post-secondary educational needs of northern Canadian residents. Distance education, then, offers to northern residents the potential of creating accessibility to degree or certificate programs without the necessity of leaving their communities.

Distance education in the North — The AU experience

Distance education as a delivery system does offer all these advantages. However, one must question how well practice conforms to the theory.

As Canada's northernmost university and as the only Canadian university committed solely to the distance delivery of university credit and degree programs, does the Athabasca University experience mirror the theory of distance education? Does the typical northern student who "attends" Athabasca University look like the student pictured above and/or the southern student? Does the AU experience have any lessons for other institutions which may be considering the delivery of degree programs by distance methods in the North?

Athabasca University does not have a "typical" student type in the North. While it is not to create a standard profile of the northern student who enrols in AU courses, the data suggest that AU students in the north are: (1) university educated professionals; (2) aged 25-34 years; and (3) "urban".

Table 1 (The data in the tables were provided by Athabasca University's Institutional Studies. The author thanks Rodney Fischer and Merla Yates for the work involved in creating these tables from the mass of registration data) demonstrates that AU attracts a significant proportion of its students from the well-educated minority in the North. In the Northwest Territories, fully fifty percent of AU's students have a college or nursing diploma, a university degree or some university training. The proportion in the Yukon Territory is slightly lower. This might indicate that individuals who enrol in AU courses are pursuing them for career-related or personal interest reasons. Yet the significant percentage (40.4% in the NWT) of registrants who have not achieved university level entrance requirements would suggest that AU is providing an opportunity for northerners to access university level studies that would otherwise have been denied them. This does not mean that all are enrolled in a degree program, (see Table 7) but it does suggest that AU's student population conforms to the expectations that exist for a distance education institution.

Table 2 does not provide one with a clear sense of who AU's students are occupationally. AU students are drawn from the complete spectrum of occupational categories with some (41.2% in the N.W.T. and 30.1% in the Yukon)

TABLE 1
Distribution of Students by Previous Education Level

	Northwest Territories										Yukon									
Education Level	Fiscal Year										Fiscal Year									
	80/81		81/82		82/83		83/84		84/85		80/81		81/82		82/83		83/84		84/85	
	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%
elementary/junior high			1	0.9	1	0.8					1	5.9								
some high school	2	3.7	13	11.3	11	8.9	15	11.9	12	7.7			3	11.5	1	3.1	4	6.9	4	5.7
high school diploma	9	16.7	27	23.5	31	25.2	30	23.8	33	21.3	1	5.9	5	19.5	6	18.8	15	25.9	11	15.7
senior matriculation diploma	3	5.6	5	4.3	5	4.1	6	4.8	6	3.9	2	11.8			2	6.3	2	3.4	1	1.4
vocational/technical school	3	5.6	10	8.7	8	6.5	10	7.9	18	11.6	2	11.8	3	11.5	3	9.4	4	6.9	12	17.1
some college/some nursing							7	5.6									3	5.2		
college/nursing diploma	6	11.1	14	12.2	8	6.5	10	7.9	16	10.3			2	7.7	6	18.8	6	10.3	3	4.3
some university	4	7.4	16	13.9	29	23.6	27	21.4	34	21.9	5	29.4	4	15.4	8	25.0	11	19.0	13	18.6
university degree	11	20.4	14	12.2	23	18.7	18	14.3	27	17.4	2	11.8	6	23.1	4	12.5	13	22.4	16	22.9
other	14	25.9	14	12.2	6	4.9			9	5.8	3	17.6	3	11.5	1	3.1			10	14.3
unknown	2	3.7	1	0.9	1	0.8	3	23.8			1	5.9			1	3.1				
TOTAL STUDENTS	54		115		123		126		155		17		26		32		58		70	

TABLE 2
Distribution of Students by Occupation

	Northwest Territories										Yukon									
Occupation	Fiscal Year										Fiscal Year									
	80/81		81/82		82/83		83/84		84/85		80/81		81/82		82/83		83/84		84/85	
	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%
homemakers			3	2.6	10	8.1	8	6.3	11	7.1					1	3.1	7	12.1	10	14.3
armed forces/police	3	5.6	5	4.3	7	5.7	5	4.0	9	5.8					3	9.4	5	8.6	3	4.3
administrator/manager			15	13.0	21	17.1	19	15.1	23	14.8	1	5.9	1	3.8	4	12.5	10	17.2	13	18.6
teacher/professor			5	4.3	11	8.9	7	5.6	13	8.4			2	7.7	3	9.4	3	5.2	3	4.3
profession other than teaching			4	3.5	2	1.6	7	5.6	3	1.9			1	3.8					3	4.3
scientist/engineer			1	0.9	1	0.8	2	1.6	1	0.6										
nurse/therapist	3	5.6	15	13.0	9	7.3	12	9.5	19	12.3	1	5.9	4	15.4	5	15.6	6	10.3	2	2.9
social scientist/social worker			8	7.0	10	8.1	3	2.4	5	3.2							1	1.7		
clerical	2	3.7	22	19.1	26	21.1	30	23.8	29	18.7			2	7.7	5	15.6	7	12.1	5	7.1
technical			4	3.5	7	6.0	3	2.4	2	1.3	1	5.9	3	11.5	2	6.33	2	3.4	5	7.1
farming/construction	1	1.9	2	1.7	3	2.4	10	7.9	6	3.9							2	3.4	4	5.7
retired/unemployed/ student	1	1.9	3	2.6	2	1.6	3	2.4	5	3.2					3	9.4	4	6.9	8	11.4
prisons							2	1.6												
other			7	6.1	7	5.7	9	7.1	17	11.0			3	11.5	2	6.3	6	10.3	11	15.7
unknown	44	81.5	21	18.3	7	5.7	6	4.8	12	7.7	14	64.7	10	38.5	4	12.5	5	8.6	3	4.3
	(*n* = 54)		(*n* = 115)		(*n* = 123)		(*n* = 126)		(*n* = 155)		(*n* = 17)		(*n* = 26)		(*n* = 32)		(*n* = 58)		(*n* = 70)	

preference toward administrative and/or professional occupations. Also, it is of interest that in the Yukon only 14% of AU students are homemakers and in the N.W.T. only 19% are clerical workers. Thus it is not clear-cut that AU's students are drawn from those categories of eligible "Would-Be-Learners" that the theory of distance education would indicate.

Table 3 reveals that the AU student population in the North is older than the university student at the traditional universities in the south. In both the Northwest Territories and the Yukon, approximately 50% of AU's students are in the age category 25 to 34. Furthermore, nearly 80% of students from both Territories are between the ages of 25 and 44. Thus, while AU's students conform to our expectation of "Would-Be-Learners" in the chronological categories, it is significant that over 3/4 of AU's northern students are in the ages that home duties and career demands are the greatest. Therefore, while courses from Athabasca University may be the only game in town (university-wise), the flexibility of time-table (self-paced, home study) may very well be the attraction of the courses.

TABLE 3
Distribution of Students by Age

Northwest Territories										
Age	Fiscal Year									
	80/81		81/82		82/83		83/84		84/85	
	#	%	#	%	#	%	#	%	#	%
under 25	8	14.8	22	19.1	16	13.0	21	16.7	20	12.9
25 to 34	33	61.1	61	53.0	59	48.0	62	49.2	74	47.7
35 to 44	8	14.8	20	17.4	40	32.5	31	24.6	48	31.0
45 to 54	4	7.4	8	7.0	8	6.5	9	7.1	8	5.2
55 to 64	1	1.9	3	26.1			2	1.6	5	3.2
65 and over			1	0.9			1	0.8		
TOTAL ST	54		115		123		126		155	
Yukon										
under 25	5	29.4	8	30.8	6	18.8	4	6.9	14	20.0
25 to 34	9	52.9	15	57.7	16	50.0	40	69.0	36	51.4
35 to 44	3	17.6	2	7.7	7	21.9	13	22.4	19	27.1
45 to 54			1	3.8	3	9.4	1	1.7	1	1.4
55 to 64										
65 and over										
TOTAL ST	17		26		32		58		70	

TABLE 4
Urban-Rural Distribution of Students

Northwest Territories					
	Urban		Rural		Total
Fiscal Year	#	%	#	%	
1980/81	14	25.9	40	74.1	54
1981/82	31	27.0	84	73.0	115
1982/83	48	39.0	75	60.0	123
1983/84	49	38.9	77	61.1	126
1984/85	65	41.9	90	58.1	155
Yukon					
	Urban		Rural		Total
Fiscal Year	#	%	#	%	
1980/81	8	47.1	9	52.9	17
1981/82	17	65.4	9	34.6	26
1982/83	23	71.9	9	28.1	32
1983/84	40	69.0	18	31.0	58
1984/85	54	77.1	16	22.9	70

Table 4 demonstrates that AU is drawing more and more of its students from the "urban" centres in the two Territories. (Urban is defined as any community with a population of 10,000 plus.) This data may appear to be misleading, given the relatively small size of urban centres in the north, but it could very well be significant. The growth in the proportion of "urban" students may reflect the marketing strategy of the university or may point to the fact that civil servants and other professionals whose opportunities for advancement in their careers are tied to educational certification are using AU as the mechanism to achieve the necessary paper qualifications for advancement. Although somewhat contrary to the expectations of the "Would-Be-Learner" in theory, the predominance of urban residents as AU students is identical to AU's experience in Alberta.

Table 5 reveals that AU's students in the North are primarily female. Once again, such data conform to Athabasca's experience in Alberta and elsewhere. In terms of the northern student, it is clear that few homemakers (7% in the N.W.T. and 14% in the Yukon) access AU courses. Does this mean that more women teachers, nurses and female civil servants are using AU as tools for occupational mobility — the only means to achieve the additional training and/or certification required for upward occupational movement? And why do so few homemakers take advantage of AU's courses? (I asked this rhetorical question in light of the theory of distance education, not the reality of the homemaker's world.)

TABLE 5
Distribution of Students by Sex

Northwest Territories					
	Male		Female		Total
Fiscal Year	#	%	#	%	
1980/81	25	46.3	29	53.7	54
1981/82	34	29.6	81	70.4	115
1982/83	46	37.4	77	62.6	123
1983/84*	51	40.5	74	58.7	126
1984/85	54	34.8	101	65.2	155
Yukon					
	Male		Female		Total
Fiscal Year	#	%	#	%	
1980/81	1	5.9	16	94.1	17
1981/82	6	23.1	20	76.9	26
1982/83	7	21.9	25	78.1	32
1983/84*	13	22.4	44	75.9	58
1984/85	17	24.3	53	75.7	70

*One undefined student.

Tables 6, 7 and 8 give university administrators much to ponder. The data clearly demonstrate that most northern residents who access courses from Athabasca University are pursuing studies in order to gain (another) degree. It is significant, however, that only a minority (36% in the Northwest Territories and 25% in the Yukon) are enrolled in AU degree programs. It is possible that many students employ AU courses to round-out degree-related studies elsewhere, a task made easy by the transfer arrangements between AU and other Canadian universities. Or the low number of students in AU degree programs reflects the "incompleteness" of AU's offerings. While some 18% of the students in the Northwest Territories are enrolled in transfer programs (including visiting students, general transfer, and co-operative nursing and social work programs), some 45% are not enrolled in any program. These students may be taking the courses for general interest (intellectual stimulation) or career mobility. When one considers the data in Table 6 (Registration by Course Level) which shows that most students are enrolled in junior level courses (often the only course taken by a student), one may debate the efficacy of creating a full-blown university program for delivery at a distance. Are the "non-program" students, especially those enrolled in Administrative Studies courses such as accounting and finance, pursuing their studies in order to obtain credentials necessary in order to achieve lateral or vertical mobility within the occupational hierarchy?

TABLE 6
Registrations by Course Level

	Northwest Territories		Yukon	
Fiscal Year	#	%	#	%
1980/81				
100 level	1	1.6	1	5.3
200 level	54	88.5	16	84.2
300 level	6	9.9	2	10.5
400 level	0		0	
TOTAL REG	(61)		(19)	
1981/82				
100 level	3	2.0	3	9.1
200 level	124	82.1	24	72.2
300 level	24	15.9	6	18.2
400 level	0		0	
TOTAL REG	(151)		(33)	
1982/83				
100 level	3	1.9	0	
200 level	131	81.4	29	82.9
300 level	27	16.7	6	17.1
400 level	0		0	
TOTAL REG	(161)		(35)	
1983/84				
100 level	10	6.8	1	1.3
200 level	112	76.2	61	81.3
300 level	25	17.0	13	17.4
400 level	0		0	
TOTAL REG	(147)		(75)	
1984/85				
100 level	4	2.2	3	3.7
200 level	137	74.1	62	77.5
300 level	44	23.7	15	18.8
400 level	0		0	
TOTAL REG	(185)		(80)	

The data provided in the tables is ambiguous when one attempts to assess any linkages between Athabasca University's experience in the north with the "theory" of distance education. On the one hand, clearly students enrolled in AU courses are not those who are enrolled in traditional universities' undergraduate programs. Thus, one might claim that Athabasca University serves the primary requirements of distance education institutions — that is, the delivery of post-secondary courses to populations that otherwise would have been denied access. This conclusion is reinforced by the large percentage of students who do not have qualifications which would permit them to enter traditional universities. In addition, the large percentage of employed students would suggest that the flexibility of distance learning systems (as represented by Athabasca University) serves the needs of the students' work schedules and home life.

On the other hand, the large numbers of students with some university education (college diplomas, nursing diplomas, etc.) suggest that post-secondary distance education courses are not serving the needs of students who otherwise would not enter a university but serve the intellectual and/or career needs of individuals who have previously demonstrated some commitment to post-secondary education. Also, the predominance of "urban" students in the sample (and declining importance of rural students) indicates that post-secondary distance education, similar to traditional post-secondary education, is primarily an urban phenomenon. Potential students from rural or, in the case of the northern territories, relatively isolated villages and towns perceive the isolation of home-study as unattractive.

A caution to distance educators

In an article to be published in *Catalyst*, Ross Paul of Athabasca University outlines the theoretical advantages of distance education as a delivery system and educational methodology for individuals who are isolated geographically and socially from the mainstream of the nation. In his paper, Paul explains the divergence of practice of distance education from the theory in a number of areas: rural and urban students, the print-base course package, the adult student, and open admissions. For the purposes of this paper, his comments on the rural student, the printed package, enhanced delivery and open admissions are important.

The remainder of the paper will address Paul's six points from the perspective of the students in northern Canada served by Athabasca University.

(1) A home study institution caters mainly to isolated rural students who have no other access to university courses.

There is no doubt that the students served by AU in northern Canada do not have access to local university level instruction. However, this does not mean that there are not any university level courses offered in the Yukon and Northwest Territories. Other universities, such as the University of British Columbia and the University of Alaska, offer courses in the north. These institutions send university instructors to northern communities to teach students in regular

TABLE 7
Distribution of Students by Program

	Northwest Territories										Yukon									
	Fiscal Year										Fiscal Year									
	80/81		81/82		82/83		83/84		84/85		80/81		81/82		82/83		83/84		84/85	
Program	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%
B. Admin.	9	16.7	22	19.1	330	24.4	35	27.8	32	[illegible]	3	17.6	8	30.8	5	15.6	19	32.8	9	12.9
after degree	2	3.7	1	0.9	6	4.9	2	1.6	3	1.9			2	7.7	1	3.1	2	3.4	2	2.9
accounting	1	1.9	11	9.6	6	4.9	3	2.4	1	0.6							1	1.7		
gen. admin.	2	3.7	2	1.7																
public admin.	3	5.6	3	2.6	1	0.8			1	0.6	1	5.9								
B.A.	1	1.9	2	1.7																
liberal			1	0.9																
no concen	1	1.9	6	5.2	8	6.5	10	7.9	7	4.5							3	5.2	3	4.3
no concern after degr																				
Canadian St					1	0.8			1	0.6			1	3.8						
Canadian St after degr							1	0.8	1	0.6										
English					1	0.8	1	0.8												
History	1	1.9	2	1.7	2	1.6	2	1.6	2	1.3										
Soc/Anthro			1	0.9	1	0.8	1	0.8	4	2.6										
French							1	0.8									1	1.7		
																	1	1.7		
B.G.S.																				
liberal			3	2.6	6	4.9	3	2.4	5	3.2										
applied	1	1.9	3	2.6	1	0.8	1	0.8	2	1.3			1	3.8	4	12.5	3	5.2	3	4.3
													1	3.8	1	3.1	1	1.7	2	2.9
general transf	4	7.4	8		4	3.3	10	7.9	8	5.2										
											3	17.6	1	3.8	1	3.1	3	5.2	21	30.0
visiting stu	3	5.6	3	2.6	10	8.1	2	1.6	10	6.5										
											1	5.9	1	3.8	2	6.3			3	4.3
non-program	21	38.9	33	28.7	42	34.1	46	36.5	69	44.5										
											6	35.3	10	38.5	16	50.0	21	36.2	25	35.9
nursing trans																				
U. of A.	2	3.7	7	6.1			2	1.6	6	3.9										
U. of C.	3	5.6	1	0.9			3	2.4	1	0.6	3	17.6	1	3.8	2	6.3	1	1.7	2	2.9
soc work tran																				
U. of C.			6	5.2	2	1.6	2	1.6	2	1.3										
																	1	1.7		
no response					2	1.6	1	0.8									1	1.7		
	(*n* = 54)		(*n* = 115)		(*n* = 123)		(*n* = 126)		(*n* = 155)		(*n* = 17)		(*n* = 26)		(*n* = 32)		(*n* = 58)		(*n* = 70)	

classroom environments but only during the terms (two sessions every other week). While northern students are isolated by southern standards, the advantages of self-paced, individual, isolated home-study courses are not immediately apparent. Indeed, it is possible that northern students, particularly those outside the major centres, wish to participate in the intellectual and social exchanges that face-to-face instruction has to offer. Home study is an excellent means for independent and confident individuals to achieve an education, but in the north it may be necessary to supplement home-study with greater personal interaction via telephone, seminar-support, and/or electronic media — teleconferencing, two-way video, or computer-conferencing. "Paced enhanced delivery" permits students to discuss the content of the course they have already received in the home-study packages.

(2) Because it has been specially designed for the home study student, the print package stands up on its own as an ideal learning vehicle for independent learners.

The independent learner in the north does not necessarily conform to southern images. The "average" student in Alberta is not isolated geographically and may well choose Athabasca University over other nearby university-level institutions. The AU student in the north may enrol in courses because they are the only courses available. (The same may be stated of "imported" courses from BC and Alaska.) However, home-study may be inappropriate for many northern students unless seminar-support (face-to-face) or teleconferencing provides more structure. It is easy for southern students to be "non-starts" or "drop-outs". It is equally convenient for northern students to become "non-starts" if structure over and above the telephone tutor is not provided.

Paul also speaks of the "reification" of knowledge in the printed course package. Face-to-face instruction,

TABLE 8
Distribution of Students by Course Registration

Fiscal Year	Northwest Territories		Yukon	
Discipline	#	%	#	%
1980/81				
Social Sc	14	23.0	7	36.8
Humanities	5	8.2	1	5.3
Sciences	18	29.6	3	15.8
Admin St	24	39.2	8	42.1
TOTAL REG	(61)		(19)	
	( )*		(-)	
1981/82				
Social Sc	20	13.2	5	15.2
Humanities	27	17.9	4	12.1
Sciences	36	23.8	16	48.5
Admin St	68	45.1	8	24.2
TOTAL REG	(151)		(33)	
	(147.5%)		(73.7%)	
1982/83				
Social Sc	30	18.6	3	8.6
Humanities	25	15.5	7	20.0
Sciences	38	23.6	11	31.4
Admin St	68	42.3	14	40.0
TOTAL REG	(161)		(35)	
	(6.6%)		(6.1%)	
1983/84				
Social Sciences	28	19.0	14	18.7
Humanities	24	16.3	9	12.0
Sciences	36	24.5	12	16.0
Admin St	59	40.2	40	53.3
TOTAL REG	(147)		(58)	
	(-8.7%)		(114.3%)	
1984/85				
Social Sciences	44	23.8	22	27.5
Humanities	24	13.0	13	16.2
Sciences	31	16.8	17	21.3
Admin St	86	46.4	28	35.0
TOTAL REG	(185)		(80)	
	(25.9%)		(6.7%)	

NOTE: Percentages in brackets below the totals represent the percentage increase over the previous fiscal year.

even the seminar support or study group, permits the student to question the "knowledge" contained in the course package than otherwise is the case, even with excellent telephone tutors. Thus, unless a student is exceptionally inquisitive or has a tutor who challenges the assumptions of the course-package, it is very possible that this "reification" of knowledge will occur.

(3) The notion of complementing and supplementing a well-designed course package is an ideal learning device, one as applicable to standard on-campus classes as it is to distance delivery.

(4) The adult learner is an independent learner. Andragogy, not pedagogy is the guiding principle.

Andragogy may very well be the ideal. The AU experience in northern Canada, similar to that in southern Canada, would suggest that many students prefer more structure, more face-to-face contact. Thus, for institutions intending to offer distance education courses in the north, other media, including teleconference, seminar support, and computer conferencing, should be considered in order to maintain or increase completion rates among adult learners.

This raises the serious question of motivation of students. It is the experience of a number of tutors, including two in this room, that students at distance learning institutions require continuous moral and instructional support. Learning at a distance is difficult and students who are less confident or encounter problems with the self-study package may very well become a "non-start" or "drop-out" unless their progress is monitored by the tutor.

(5) Open admissions and self-pacing lend flexibility to the student and therefore it is easier to get a degree at a distance education university than in traditional universities.

Many students, tutors, co-ordinators and administrators in the distance education institutions argue that it is much more difficult to obtain a degree through home-study than it is from the traditional universities.

(6) With no students on campus and no classes to timetable, management of a distance education institution is similar to that of the production line and therefore avoids many of the complexities of university management. (Paul, 1986)

Distance education universities and institutions are, by all accounts, most difficult institutions to administer. The degree of team work that is required to ensure that a course is developed and delivered to the student demands administrative skills not only on the part of the vice-presidents, deans and department heads but also on the part of the professors who are required to write the courses, orient tutors who are subject area specialists, and co-ordinate the delivery of the courses to students. In addition, the overall planning demanded of the various managers in the distance learning institution to ensure that students are registered promptly, that course packages are delivered quickly, that courses are developed, refereed and produced (printed) according to schedule is immense. And when one considers that students might require special counselling, seminar-support or teleconference facilities, and have the opportunity to enroll year-round, these logistical difficulties are multiplied.

Conclusions

Unfortunately when one offers a "critical" perspective on an educational innovation, too often it sounds negative. This was not the intent of the talk. Rather, I wished to provide, from a relative newcomer to the distance education world, an honest reflection of the problems which confront the administrator and practitioner in a distance education institution. I, like my colleagues — administrators, professors, and tutors — am enthused about the potential of distance education. We see distance education as one of a number of processes that will permit the expansion of educational opportunity to disenfranchised Canadians — homemakers, workers, early school leavers, inmates in correctional or medical facilities, and those who are socially or geographically remote. Distance education has a great potential in Northern Canada and, although not the panacea for all educational difficulties confronted by northern educational administrators, is one that should be considered. However, educational administrators and practitioners must be aware of the encumbrances as well as the promises of any distance educational process.

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Note

Data in the tables were provided by Athabasca University's Institutional Studies. The author wishes to acknowledge the contribution of Rodney Fischer and Merla Yates (ed).

THE OPEN UNIVERSITY CONSORTIUM OF BRITISH COLUMBIA: WHAT ARE THE IMPLICATIONS OF CONSORTIA FOR THE NORTHWEST TERRITORIES AND THE YUKON?

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Introduction

> "Since 1929, when the British Columbia Government became the first in North America to offer a high school education by mail, our province has led the way in implementing new technology to better our greatest natural resources: the skills of our people. Now the Open Learning Institute, the three universities and the Knowledge Network are cooperating to ensure that every British Columbian can obtain a university degree, no matter what his or her geographical location, financial circumstances or previous academic achievement. Welcome to the world's most forward-looking educational system."

The above quotation was a message from British Columbia's Minister of Universities, Science and Communications, Patrick L. McGeer, in his introduction to the first calendar for the Open University Consortium of B.C. The University of British Columbia, Simon Fraser University, the University of Victoria, the Open Learning Institute and the Knowledge Network of the West agreed in August 1984 to establish the Open University Consortium of B.C. The Consortium was to coordinate formally the planning and delivery of distance education program activities to ensure that every person in British Columbia, regardless of place of residence, has an opportunity to complete recognized university degrees and other approved university-level programs and courses, through distance learning methods. The removal of transfer restrictions from the Open Learning Institute's Bachelor of Arts degree, making this degree one whose requirements can be satisfied through courses offered by all four degree granting institutions, should help achieve the former Minister's worthy objective of accessibility to higher education for all provincial residents. The eventual creation of an academic credit banking mechanism will contribute significantly to meet this objective. The Consortium, I think, may have important implications for residents of the Northwest Territories and the Yukon through the future creation of their own "Northern Open University Without Walls."

British Columbia's distance education system

Before describing potential developments for the north, it is necessary to describe the distance educational system that has evolved in B.C. It should be noted that there are more detailed reports available for researchers including the "MacDonald Report" (1962), the "Winegard Report" (1976) and the Educational Research Institute of British Columbia Report (1982) on Learning at a Distance and the New Technology.

As part of an extended and enriched service to provincial residents, the three universities have developed distance learning programs through their divisions of continuing education or studies. With their own special resources and facilities, they have been able to provide courses and programs of particular interest to adult students seeking to improve their formal qualifications in such varied fields as Nursing, Forestry, Criminology, Kinesiology, Social Work, Information Systems, Public Sector Management, Education, and in the Arts and the Social Sciences. The activities of the Open Learning Institute, which is solely devoted to distance education learning, add significantly to programming possibilities, and the recent creation of the Knowledge Network of the West with its telecast facilities has also fostered the development and production of high quality educational programs and materials. In the main, British Columbia has been a leader in providing educational opportunities to students who must learn at a distance, long before the establishment of the Open University Consortium of B.C.

The Guided Independent Study program at The University of British Columbia has the longest history of involvement in distance education. The program was originally designed in 1949 to meet the degree-completion requirements of practicing teachers throughout the Province. Many changes have occurred over the years, and the program in 1984 had about 1113 course enrollees in many different disciplines and professions including courses through the Faculties of Arts, Education, Forestry, and Science and by the School of Nursing.

While technological change has had considerable impact on UBC's traditional correspondence courses and many of them are now enriched by the addition of audio-tapes, laboratory kits, and books of readings, the program still largely depends on a core of print materials supported by an External Library Service and by a free telephone service connecting students with course tutors.

Technological change has recently encouraged the closer coordination of Audio-Visual Services and Guided Independent Study in the development of courses for telecast on the Knowledge Network (Gray 1984:11). The joint effort of the two principal departments responsible for the administration of distance education programs should serve to provide a more coherent service to academic departments and to distance education students at UBC.

The University Extension Division of the University of Victoria has responsibility for coordinating the "outreach" program for distance education students. The Division, in cooperation with each School and Faculty of the University which is involved in distance education, coordinates the delivery of courses for students learning at a distance (E.R.I.B.C., 1982:20-21). The first credit programs were offered in 1976, but the University Extension component relating to distance learning became involved only in 1978. By October 31, 1981 about 300 students were enrolled in distance education programs, and in 1984 there were about 1016 credit students in various programs with a large number of students in noncredit programs, too. Nursing, Social Work, Public Administration, Education and Child Care are the discipline areas in which the university has developed its own unique programmatic strengths.

Counselling and general program services are provided by faculty, usually by telephone. Most courses produced by on-campus regular faculty have an interactive tutoring component. This is a basic component of the interactive Knowledge Network television programs in which about 60 percent of the learning at a distance activities were involved in 1982 (1982:20). Special extension library services are also available to students, and materials are either mailed to students or they are able to obtain learning resources through local colleges where special arrangements have been made. The University of Victoria has generally been very supportive of new communication technology for the delivery of information at a distance.

The Open Learning Institute of British Columbia was established in June 1978 by order-in-council of the provincial government. The Institute, which has been described in detail elsewhere, has as its mandate to provide programs in adult basic education, career-technical-vocational subjects and in programs leading to a first degree in arts (Mugridge, 1981:98-109). Since September 1979, the Institute has been offering credit programs exclusively for learning at a distance, and has received worldwide attention. During the 1984 calendar year, the university enrolment was about 4791 students.

There are currently eight academic areas in which a university student can concentrate while studying for a B.A. degree. These are Economics, History, Psychology, English, Sociology, Geography, Mathematics and Biology. The areas of concentration will, of course, expand dramatically as the full potentialities of the Consortium unfold.

Most of the course materials are made available to students in print format. By 1982, OLI had offered in conjunction with other institutions more than a dozen telecourses via the Knowledge Network. A limited number of credit courses have audio-cassettes as supplementary learning material. Support services for students are provided in a variety of ways (E.R.I.B.C., 1982:25; Meakin, 1982: 157-159). Telephone tutoring services are the primary support service. Library support services for OLI are arranged through Simon Fraser University and students can phone (toll free) a reference librarian to request books or copies of journal articles. Being devoted solely to distance education learning, the Institute is able to concentrate on a variety of instructional and technological innovations with the possibility of using them to enhance their course delivery system.

The Knowledge Network of the West (KNOW) was created by cabinet and incorporated as a nonprofit society under the Societies Act in May 1980. The Knowledge Network is not an educational institution and does not itself offer courses, although it was created to serve as an electronic classroom for the province. Essentially, it is an educational telecommunications authority with the responsibility to assist and collaborate with educational institutions in the development and distribution of high quality programs by satellite and cable TV.

Learning systems development has focused on three primary elements since KNOW's inception. The element receiving the most emphasis to date has been the establishment of community cable systems. There are now more than 247 communities in British Columbia that can receive the Knowledge Network signal. The second area of focus has been the creation of a universities communication system. This closed circuit system, which is still under development, links the universities, teaching hospitals and law courts in Vancouver and Victoria. This system, for example, will enable medical students at the University of British Columbia to observe medical procedures at a teaching hospital without having to travel to the hospital (E.R.I.B.C., 1982:27).

Finally, the third element that is being developed is an inter-institutional instructional network. This service uses a closed circuit system of cable with low-powered line-of-sight instructional television transmitters that transmit educational programs from the metropolitan areas to interior and northern locations of the province. The resources of KNOW are available to the Open University Consortium, and a substantial number of the Consortium's offerings will be supported by telecasts.

Simon Fraser University's Centre for Distance Education, formerly called Directed Independent Study Course (DISC) Program, offered on behalf of academic departments its first four courses in 1975, enrolling 55 students. The Centre with a still-expanding curriculum plans to make available about 130 courses each year. The main offerings are in Criminology, Education, Kinesiology, Ethnic Relations, and Gerontology with other courses from the Faculty of Arts and the Faculty of Science supporting the main subject areas. Although the Centre has not significantly increased its course offerings on behalf of academic departments between 1982 and 1985, the enrolment has increased by over 100 percent for a total 1985 enrolment of 5203 students, making this university program the largest distance education program in the province.

Courses are normally written by regular faculty in consultation with Centre personnel, and their content and academic standards are equivalent in all ways to parallel courses offered on campus. Although most courses are print-based, about 20 percent include audio-tapes, and two percent videotapes; some courses extensively use the Knowledge Network for support materials (Sturrock and Yerbury 1982:37-39). In a few cases, the audio-tapes are used for all lectures; in others, they are used to provide background material.

Interaction in distance education courses is provided by tutor-markers, who are either regular faculty or senior graduate students (Sturrock 1983:108-113). They keep in touch with the student by telephone and provide students with detailed written reports on all work submitted. They have regular telephone consultation hours, during which the student can call them collect to discuss any problems or questions that might arise. Students can also call the Centre's office collect, for information about materials and procedures, and students have a network system in which they can call one another to discuss common interests and concerns.

Students also have access to the External Librarian, who will search for relevant materials, or send out materials specified by the students; books or photocopies of journal articles are delivered by mail. This service is available 24 hours a day, and students can call collect.

The Centre operates on the same schedule as the rest of the university. Courses last 16 weeks, and include a two-week examination period. Most courses have assignment deadlines to help students pace their work. Evaluation of student work is based on a combination of written assignments and the final examination. The retention rate for students is probably the highest in Canada at about 94 percent.

All distance education study courses are subject to constant evaluation by students, faculty and Centre personnel, and the results of this evaluation are used in course revision. Before the course is first produced, it is subject to the evaluation of the relevant Academic Department and Centre personnel.

The Centre's plans for the future include more courses in Criminology, Education, Kinesiology, Gerontology, Canadian Studies, Communications, Ethnic Relations and Computing Science, and also other courses which support programs in these areas. Already distance education students can work towards certificates in Health and Fitness, certificates in Criminology, and an Extended Studies Diploma in Education, Ethnic Relations, and Criminology. Students can complete a full Bachelor of General Studies degree through distance learning.

In short, the institutions and educational telecommunications authority described above have used a variety of methods in providing services for students learning at a distance. Care has been taken over the years to ensure that program and course duplication did not occur. Inter-institutional cooperation has resulted in bilateral arrangements between institutions for joint development of new courses in the distance education mode. The distance barrier for those who wish to learn would seem to have been overcome by educational opportunities that evolved out of inter-institutional cooperation. In short, why do we need a consortium in British Columbia?

The consortium and its implications

The creation of the Open University Consortium of B.C. was through a ministerial initiative. In March 1984, the Minister of Universities, Science and Communications requested the formation of a committee that would, under the Chairmanship of Dr. W.C. Gibson of the Universities Council of B.C., "draft a plan by which a student will be able to acquire a B.C. degree by distance education", through a combination of courses from the three universities and the Open Learning Institute, and by taking advantage of Knowledge Network facilities.

From the Minister's point of view, there was doubtlessly an obvious need to coordinate and jointly promote the impressive breadth of distance education university courses and programs offered by the three universities and OLI. While all four institutions offered courses leading to a baccalaureate degree, it was also generally apparent that restrictions existed regarding the number of credits that must be taken from the institution granting the degree. The objective of accessibility to higher education to all British Columbians, regardless of their place of residence, thus, seemed hindered by a lack of formal coordination.

The Distance Education Consortium Committee submitted its report to the Minister on July 19, 1984. The

Committee strongly recommended that the objective of the Minister could be met by OLI's Bachelor of Arts degree becoming an "open" degree, and that the Institute establish and manage an academic credit bank. The formation of the Consortium was formally announced on September 7, 1984. The Minister's announcement included a statement that more than 130 lower and upper level courses in Arts and Science were now available through the combined four institutions, as well as 115 courses directed toward credentials in professional and semi-professional fields in one administrative organization. This announcement was, doubtlessly, misinterpreted by faculty of member institutions, many of whom feared the potential erosion of institutional autonomy.

The Consortium was a political creation. Many academics at Simon Fraser University perceived the Consortium as an organization that had suddenly subverted their institutional distance education programs. Other institutional members of the Consortium assumed that the degrees of the Consortium would be the degrees of the Open Learning Institute. The concept of the Consortium, its guiding principles, and operational model are only now being formulated by the Consortium Board of Directors, hopefully respecting equal partnership and autonomy.

The Open University Consortium of B.C. does not offer degrees, certificates or diplomas. It exists to facilitate the offering of the degrees, certificates, diplomas and other university level credentials of its member institutions that are free of conventional residence requirements. A major feature of these programs will be the existence of a major component of independent study.

The degree that enables students to use all the available course offerings listed in the Consortium calendar will be the newly created Learning Institute Bachelor of General Studies. Degree requirements and academic standards for this program and others will be advised by an Academic Council for the Open Learning Institute. This Council consists of sixteen persons, with four persons nominated by the Chairman of the Senate of each of the three universities and four persons nominated by the Principal of the Open Learning Institute. Other degree, certificate and diploma programs, with varying restrictions, will continue to be offered by the member institutions. Individual institutions, thus, have the right to define and offer their own programs, and to control admission to such programs, whether in a face-to-face or distance delivery mode.

Another important implication of the Consortium for Simon Fraser University arises from its function of coordinating needs, assessment procedures and program planning for the purpose of developing an annual program and budget submission for government. While the Centre is one of the most cost-effective programs in Canada, the program has survived over the years on special government grants (soft money). Financial restraint and cuts in government expenditures are the order of the day; nevertheless, the government has, I think, demonstrated a commitment and enthusiasm for ensuring that the Province's long and creditable history of distance education continues.

In sum, the creation of the Consortium has had the additional benefit of publicizing the universities' distance education activities and their programmatic strengths. The development of a comprehensive calendar describing currently available programs and courses and the commitment of individual institutions to reciprocally promote the programs of member institutions should succeed in increasing the overall profile of distance education activities in the Province. In distance education, the Province is truly one of the world's most forward-looking educational systems. We have just only begun to comprehend seriously the evolution of our system; we certainly have not looked at the Consortium's implications beyond our provincial boundaries. There have been queen-pawn-four openings. The game is yet really to begin in British Columbia.

What are the implications for territorial governments and northern students?

Consortia are a growing trend in educational programming (Zigerell, 1983). They are formed for a variety of reasons including an effort to share resources, to meet the curriculum needs of adult learners, to coordinate education course and program development and to ensure academic and instructional quality. Not all consortia are successful: especially consortia imposed externally by government. Consortia must evolve on their own in response to common needs and problems (1983: 415).

There is an opportunity, I think, for northern governments and residents to exploit and benefit from organizations such as the Open University Consortium of B.C., the Council of Ontario Universities Committee on Distance Education, the Association of Atlantic Universities, and the many other universities offering distance education programs in southern Canada. The Northwest Territories and the Yukon do not need a distance education consortium; there is no need to belong to a consortium. There is the potential, however, to create a northern university open degree program through exploiting the educational resources of southern consortia and institutions. How can you stake your claim and accomplish this?

It is suggested that the time is right for both exploring and implementing a credit consolidation service by either the Yukon or Northwest Territories or both jointly. The formation of a Territorial credit bank and external degree program would serve to provide a mechanism for organizing and recognizing a coherent and sequential program of post-secondary education for adult learners who have obtained credits and have completed certificate and diploma programs at southern provincial post-secondary institutions. Increased contact with the public and other post-secondary institutions in southern Canada by Territorial residents has made it clear that credit consolidation is now an important issue. Post-secondary institutions are now receiving more and more admission applications from northern adult learners who have diverse and, often, extensive prior educational experience and who wish to either consolidate their background of learning or to complete specific courses or programs that are more directly related to their current interests and occupations. A system of credit consolidation would be of particular benefit to northern adult learners.

Although many Canadian universities offer distance education courses, their course offerings throughout the provinces tend to be limited and often do not constitute entire programs. Course selection is also restricted by rigid transfer policies. The transfer policies of most institutions generally require that students take the majority of their upper division or third and fourth year courses from the institution of initial registration. Often, adult learners have limited access to upper division university courses, and have limited access to university programs because of current restrictive transfer policies. For this reason, it may be imperative to act soon to develop a credit consolidation and degree granting service, independent of southern universities.

Proposed territorial credit bank and external degree system

The role that I envision for a *Credit Bank* or *Educational Registry* is a system that would serve as an evaluation and transcript service for adult learners who are interested in consolidating their academic records for employment or educational purposes, or who are interested in having an official statement of personal accomplishments. The credit bank organization should be accredited or otherwise recognized by other educational institutions or employer organizations, so that the student may have a single valid document to present as evidence of prior learning from a variety of sources.

The *External Degree Program* may be one of several types, some of which need to be attached to a particular institution and its programs, and others of which combine a credit bank function with degree-granting and can operate as independent organizations. The latter may be the answer.

In order to implement a credit consolidation service, the Educational Registry should be given the authority to grant an open degree — a Bachelor of General Studies (B.G.S.). The essence of such a degree is the freedom to tailor a program to the past educational experience and future goals of the student whether those goals are personal development or career achievement. It follows from this that there should never be, in my view, any predetermined programs of study required for such a degree. The B.G.S. will probably be used in two ways:

1) An open degree or B.G.S. can be used as a general degree without any particular vocational emphasis or without planned major areas of subject interest. The B.G.S. would function as an academic credential recognizing prior academic attainment through a variety of traditional and nontraditional teaching methods. Some discretion should be used by the registry to ensure that the B.G.S. reflects some breadth of educational experience. If the advanced educational credit has been in a fairly restricted area, and there is no particular format or direction given by the student's needs or requirements, the student should be required to range widely in courses chosen for degree completion. Also, some otherwise acceptable advanced credit might be refused in order to assure academic breadth.

2) An open degree or B.G.S. can probably be used effectively as a career qualification recognizing competencies developed either in the past or in the future. More specifically, a student's degree program would be created through an individually tailored plan that can incorporate specific courses to be taken from a variety of institutions and through a variety of teaching methods. The major criteria would be vocational and career utility to the student through the completion of university level study.

It should be made explicit that in determining requirements for a B.G.S. degree, which is non-resident, carefully defined authority will have to be given to make such approvals (Henry and Minnis, 1977). Whoever or whatever has this authority will be able, in effect, to award degrees without reference to normal university processes: a Northern University without walls and faculty.

To conclude, while I have indicated that the creation of the Open University Consortium of B.C. has generally been positive towards publicizing provincial university distance education activities and their programmatic strengths and towards encouraging institutional cooperation, it is to be remembered that the Consortium was a political creation; it may be an aberration. It is strongly suggested that the Yukon and Northwest Territories need neither membership in southern consortia nor affiliation with southern universities. What is needed instead is a mechanism for exploiting and benefiting from the distance educational resources of southern institutions. A northern Credit Bank or Educational Registry and an External Degree Program are such mechanisms. Stake your claim and exploit the available educational resources: create a "northern university without walls."

The author is indebted to June Sturrock and Jack Blaney for their comments. The author is, of course, responsible for his opinions on distance education activities in B.C. and the Yukon and Northwest Territories.

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Note

The University of British Columbia has 8-10 instructors who conduct its Arts and Science program in Whitehorse. It also runs a summer institute there to provide courses for teachers. The Knowledge Network provides 98 hours of material, per week, to the two territories via the Anik C-3 satellite. Most communities which have a satellite dish can receive these programs. All of the B.C. universities have distance education students in the territories. Simon Fraser, for example has a growing number of Criminology students there (ed).

THE LEARN/ALASKA NETWORK

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Communication is many things. It is the transportation of goods, services and people. It is also the transportation of ideas and information. Communication among Alaskans has always been a challenge. There have been great barriers to overcome — distance, time, and weather. Yet methods have always been found: canoes and kayaks, trails and roads, the frail wings of bush planes, the telegraph, radio, television and satellites.

Education is communication, the communication of ideas, information, and motivation. The Learn/Alaska Network is a transportation system using many ways to communicate education.

The Learn/Alaska Network is a statewide instructional telecommunications system encompassing three distinct yet interrelated networks to provide the maximum in teleconferencing capabilities within the State of Alaska and locations worldwide. The network consists of the world's first and largest low power television transmitter system, audioconferencing two-wire bridging system (including teletext and audiographics), and computer conferencing.

The Learn/Alaska Network regularly provides teleconferencing between the State of Alaska, other U.S. states, Canada, Greenland and Europe. In addition to providing teleconferencing bilingually on an international basis, the network also serves 14 basic language groups within the State of Alaska.

Background

The State of Alaska is a land mass of 550,000 square miles (one-fifth the size of the United States), with more coastline than all the other 49 states combined. The population of Alaska is approximately 400,000. Of this number, nearly 60 percent are located in one major urban center (Anchorage). The balance are scattered among almost 250 communities, many of which have as few as 15 or 20 residents.

Of the approximately 250 communities in Alaska, only 15 percent are accessible by road or trail. The balance can only be reached by air or water. Because of this lack of a basic transportation network, the development of terrestrially based telecommunications systems has been limited to the larger population centers. Prior to the development of the Small Earth Station Program in the mid-'70s, which uses satellite communications to provide some minimal basic telephone service, VHF radio was the only means of communication for many of these communities.

It was in this scenario that the Alaska State Legislature requested the Department of Education and the University Statewide System to explore the use of satellite delivered television and audioconferencing as a way to deliver teleconferencing instruction of a constant quality to all citizens of the state.

The Learn/Alaska Network has three major components currently active:

1. Satellite based 24-hour a day instructional television network downlinked to 250 low power TV transmitters.
2. Eighty-line, two-wire dial-up audioconferencing bridging network accessible via any voice-grade transmission line in the world, and with 200 specially equipped audioconferencing sites within the state.
3. Effective statewide computer network with three distinct applications: (A) electronic mail service and computer data banks; (B) teletext system utilizing the television vertical blanking interval to remote printers and monitors and a point to multipoint downloading of Apple II microprocessors; and (C) computer conferencing via the audioconferencing bridging network.

All three major components of the Learn/Alaska Network have stand-alone functions and assignments related to instructional and administrative uses by educators, federal and state agencies, and private/public groups. However, the network's maximum utility is realized when all three components combine together to provide a high level of service in the form of teleconferencing, point-to-point and multi-point. Two-way video conferences and one-way video/two-way audio conferences receive high priority time on the network.

Audioconferencing bridging system

There are now 200 Learn/Alaska audioconferencing sites in 145 Alaskan communities. The network anticipates expansion to 300 audioconferencing sites in 250 Alaskan communities. Each site has been established under formal agreement between the local educational sponsor, other educational users in participating communities and Learn/Alaska. This agreement assures multi-user access to the site, and identifies the individuals who will receive site coordinator training, thus becoming responsible for local access and appropriate utilization of the network.

To date, the audioconferencing network has used dial-up distance phone service via Alascom, Alaska's long-line carrier. Calls are bridged together via four interconnected twenty-line Darome conferencing bridges. Scheduling for University of Alaska instructional use is made on a semester basis. Shorter scheduling frameworks are currently used by the Alaska Department of Education and school districts. More occasional users book network time up to one day prior to a proposed conference. Local audioconference participation is coordinated by the Audio Site Coordinator. Each established site has access to one or more portable Darome, Icon, or Contech conveners. A convener consists of a small speaker and push-to-talk microphones linked into the speaker. A single phoneline jack is used to interface a phone and convener. The

Learn/Alaska audioconferencing network uses the same phone circuitry as does Alascom for all dial-up long distance traffic.

The audioconferencing system operates 120 hours per week and handles up to 180 conferences per week. Conference operators can handle from three to 80 sites per conference, and can conduct up to eight conferences simultaneously. The system conferences with other audioconferencing bridging networks in other U.S. states as well as Canada, Greenland and Europe.

The audioconferencing system handles more conferences per operator than any other system presently in operation. Conferences are operator-assisted, but automatic meet-me conference service is also provided. Since there are 29 different telephone companies in Alaska, phone line quality varies from site to site and operators adjust line sensitivity manually to ensure the best possible conference quality. Within any given conference, operators may be establishing connections with ships at sea, foreign longline carriers, U.S. sites, and Alaska locations. The audioconferencing system currently handles more than 400 conferences per month and is operationally equipped to handle approximately 850 conferences per month. The audioconferencing network operates year round for the benefit of educational institutions and state and federal agencies.

Seventy percent of all conferences are instructional in nature, with the balance being administrative or instructional support. The audioconferencing system has also developed technology and operational procedures to regularly provide conferencing services between ships and land service. Slow-scan technology supplied on a regional basis in the network and the Telidon teletext system provide the primary audiographics capabilities.

One typical use of the network involved approximately 450 high school students who audioconferenced with NASA astronaut Vance Brand, a space shuttle pilot, who spoke from Washington, D.C. for about 90 minutes with Alaskan students at 15 locations scattered throughout the state. According to NASA officials this was the first time they had arranged for an educational audioconference event of this nature involving astronauts and school students. This highly valuable educational experience would not have been possible except via audioconferencing, and it cost approximately $1.33 per student for the activity.

Instructional television network

The Learn/Alaska Network television system is satellite-based and was the first low power television network to be licensed by the Federal Communications Commission and to become operational in the United States. Access to satellite-delivered programming sources is via the network's nine-meter earth station, located in Eagle River Valley outside of Anchorage. Programming is currently accessed from various satellites, and the earth station, which is steerable, is technically capable of accessing the Canadian ANIK satellites. From Eagle River, programming is microwaved to the Operations Center, and then fed directly via microwave to the Alascom toll center for uplinking to Satcom F5, Transponder 20, or is taped for delay transmission. The Learn/Alaska system has uplink capability in Juneau, Fairbanks and Kotzebue, as well as occasional uplink from 30 other Alaskan sites. Once uplinked to Transponder 20, programming is received in local sites via small (4.5-meter) earth stations. Local distribution is via low power VHF or UHF transmitters, under the new low power licenses recently established by the FCC. Currently, the network broadcasts 24-hours a day every day of the year to the entire State of Alaska (250 transmitter sites).

The television system is received in virtually every home in the broadcast area of the local "mini" transmitter. This type of primary access suggests that viewers participating in a formal or informal learning project via television will be doing so independently, or within the informal context of familiar companionship (rather than with classmates). The open distribution and public nature of this instructional/informational delivery system allow it to serve broadly-based educational interests and needs. As greater channel capacity becomes a reality, a greater degree of instructional specialization will become feasible. Alaska's four time zones also pose unusual challenges in the statewide scheduling of one channel.

Since the city of Anchorage is the major urban center of Alaska, with approximately 60 percent of the state's population, the Learn/Alaska Network is also installing a four-channel ITFS system to aid in the delivery of specialized educational programming for use at 15 remote community college learning centers within the city.

Computer conferencing system

Learn/Alaska personnel currently use two existing computer networks for electronic mail service to all university locations — 23 in all — by dedicated line and worldwide services by telephone modem. The other is the EMS system established by the Department of Education, which connects all 52 of the state school districts together.

The audioconferencing bridges are used for computer conferences in which one site of a multiple site conference is designated as the location for the transmit microcomputer for data transfer. Since the audioconferencing system is based on the two-wire dial-up technology, the present equipment configuration only allows for half-duplex computer data transmission.

The Learn/Alaska Network uses the Telidon based broadcast teletext system, which will be the largest broadcast teletext service in the United States. It is providing the first simultaneous use of broadcast teletext service incorporating a data stream which will download microcomputers at any location capable of receiving the Learn/Alaska broadcast signal. The Telidon teletext system utilizes the AT&T PLP standard and is used to provide audiographics for the audioconferencing system. It also provides for a data stream to be delivered through the television vertical blanking interval to hard copy printers. Each of the 250 Learn/Alaska Network low power TV transmitter sites provides retrieval access to the teletext magazines.

Unique to the network's teletext project is its ability to provide point to multipoint downloading of Apple II microprocessors. This allows the rapid distribution of microcomputer programs for immediate use by any one in the state who has an Apple computer, a television set and an inexpensive teletext decoder. This particular teletext service will give an instructor or administrator using audioconferencing the capacity to display on a standard television receiver textual or color graphic information that can be selected and called upon by an individual student at will.

The goal of the Learn/Alaska Network is to remain flexible and sensitive to the needs of the communities it services. It is working to solve important educational problems in Alaska, and television, video conferences, audio conferences and computer technology are simply aids for educators and students. The network is a way to deliver education, not the education itself.

Despite rapid changes in the last decade, Alaska is still very much a developing country, possessing vast resources, a thinly distributed population, limited technology, a recently acquired democratic tradition and newly gained institutional wealth. Like other countries, its approach is to partially subsidize the cost of establishing its telecommunications system, a significant break in the American tradition. Successful development, economic growth and human services depend upon the adequate supply of information based services.

With the support of the State of Alaska, the Learn/Alaska Network is reaching out across the state to bring increased knowledge and participation to all Alaskans. It is a transportation system, delivering education, communicating ideas and information and bringing Alaskans closer to each other and to the world.

Note

Charles Hickman contributed to the ACUNS meetings in Yellowknife via satellite. This article is reprinted, with permission, from *Teleconference*, July/August 1983, 24-30 (ed.).

INFORMATION SYSTEMS AND THE NORTH

INFORMATION SYSTEMS AND THE NORTH

Northern residents and those in 'the South' who are interested in the North are bewildered by the multitude of sources of northern information and systems for the transfer of that information which exist, in Canada and abroad, today. The NORTHERN AND OFFSHORE INFORMATION RESOURCES SEMINARS (NOIRS) were developed to encourage links between northern information specialists in Canada (see the following article by Clarke and Goodwin). Papers published here represent those presented at the fourth of these seminars with a number of additional papers from earlier meetings.

ACUNS was delighted to cooperate with the NOIRS group through joint meetings in Yellowknife. The Association regards itself, at base, as a "networking" organization the purpose of which is to stimulate flows of information. Our office, meetings and publications, for example, all serve this purpose. Further, ACUNS has a longstanding interest in 'the information business' in a more technical sense. In 1980, the Association tried valiantly to replace the Arctic Institute of North America's *Arctic Bibliography*, sixteen invaluable volumes of which were published before it became defunct in 1975. It developed a proposal to technologically link a number of major libraries in Canada in a single northern information system. Unfortunately, this project foundered for lack of financial and other support.

It is interesting (see article by Sokolov in this section) that, as a result of Congress's "Arctic Research Policy Act", 1984, the United States is now moving purposefully towards such a northern information network. Ms. Sokolov says that the network's purpose is to increase research efficiency and assist decision making by making it possible for a user (e.g. northern resident, researcher, business person), *anywhere in the U.S.A.*, to easily determine if information on a particular arctic topic exists and, if so, how and where to obtain it. The aim, she says, is to link existing systems into a whole, strengthening and filling gaps where necessary.

Although the jurisdictional situation (provinces — Territories — federal government) and, one suspects, the diversity of northern organizations in Canada are more complex than in the U.S., *surely* there is something we can do to develop a more effective information network in Canada? The NOIR group deserve our support.

Ms. Sokolov concludes her article with a suggestion for an *international* polar network. Again, here is an idea which Canada has toyed with and indeed, which we have taken serious steps to develop. Canada was the key founding member of the Northern Libraries Colloquy and continues to be a major player in it (see, for example, "Polar and Cold Regions Library Resources; a Directory", compiled and edited by Robin Minion and Geraldine A. Cooke, Edmonton, Alberta, Northern Libraries Colloquy 1985, available from the Boreal Institute for Northern Studies, University of Alberta). The Colloquy has developed *personal* links between all the major libraries, and related organizations, which specialize in Arctic and Antarctic information. A useful source of information in this group is the *Northern Libraries Bulletin* which is published a number of times each year from the Alaska Historical Library, Box G, Juneau, Alaska 99811-0571, U.S.A.

Canada, as a small nation responsible for a huge northern territory, stands to benefit enormously from effectively tapping information generated anywhere in the north polar or south polar regions. The people of Canada's North would reap particularly rich benefits.

This section provides a good sample of Canada's northern information resources and examples of resources in the U.S.A. Some of these 'resources' are highly automated systems others are simpler, but no less valuable for that, libraries and archives. The selection includes resources managed by native peoples' organizations, governments, universities and industry, in the North and in the South.

In Canada, the two Territories are in the early stages of developing their information resources. It is notable that both already have a remarkably large number of valuable collections, some involving ten languages. ACUNS urges groups and individuals with polar interests, in Canada and abroad, to routinely deposit publications in the Territorial libraries and archives.

Ms. Abel, in her article, points out that the Dene think of the Dene Nation Library/Archives as a 'Pot of Written Gold'. We might well ponder this image for Canada as a whole.

The groups represented in this section are given below. Full addresses and 'phone numbers are included in each article. Those which are located in the two Territories are indicated with an asterisk.

Northern and Offshore Information Resources (NOIR) group
*Yukon Archives, Whitehorse, Yukon
*Dene Nation Library Archives, Yellowknife, N.W.T.
*N.W.T. Archives Library, Prince of Wales Northern Heritage Centre, Yellowknife, N.W.T.

Education, Research, Information Systems and the North

*N.W.T. Government Library, Yellowknife, N.W.T.
*N.W.T. Renewable Resources Library, Yellowknife, N.W.T.
*Occupational Health and Safety Information Service Resource Center, Yellowknife, N.W.T.
*N.W.T. Public Library Services, Hay River, N.W.T.
*Indian and Northern Affairs Canada Technical Library, Yellowknife, N.W.T.
National Library of Canada, Ottawa, Ontario
Cold Regions Research and Engineering Laboratory Library, Hanover, N.H., U.S.A.
Canada Institute for Scientific and Technical Information (CISTI), Ottawa, Ontario
*Indian and Northern Affairs Canada Northern Land Use Planning Office, Yellowknife, N.W.T.
Arctic Environmental Information and Data Center, University of Alaska, Fairbanks, Alaska, U.S.A.
Arctic Science and Technology Information System (ASTIS), Arctic Institute of North America, University of Calgary, Calgary, Alberta
Centre for Frontier Engineering Research (C-FER), University of Alberta, Edmonton, Alberta
Boreal Institute for Northern Studies Library, University of Alberta, Edmonton, Alberta
World Data Center A for Glaciology, Boulder, Colorado, U.S.A.
Fire Science Centre, University of New Brunswick, Fredericton, N.B.
Centre for Cold Ocean Resources Engineering (C-CORE), Memorial University, St. John's, Newfoundland
National GEOSCAN Centre, Geological Survey of Canada, Energy Mines & Resources, Ottawa, Ontario
Inland Waters Directorate, Environment Canada, Hull, P.Q.
Pallister Resource Management Limited, Calgary, Alberta
Cambridge Scientific Absiracts (Aquatic Sciences and Fisheries Abstracts), Bethesda, Md., U.S.A.
QL Systems, Calgary, Alberta
Hochelaga Research Institute, Montreal, P.Q.

THE NORTHERN AND OFFSHORE INFORMATION RESOURCES (NOIR) SEMINARS, 1985-86: AN APPROACH TO CO-OPERATIVE MARKETING

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An earlier version of this paper will appear in the Proceedings of the Eleventh Northern Libraries Colloquy, Lulea, Sweden, June 9-12, 1986. The Proceedings of these colloquys are an important source for those interested in polar information systems.

This paper describes the Northern and Offshore Information Resources seminars, held in four Canadian cities during 1985 and early 1986. The purpose of the seminars was to bring together information professionals and end-users to learn about available resources and methods of retrieval of information on northern and offshore regions. By cooperatively organizing and presenting the seminars, information providers were able to meet with, and describe their services to, large numbers of users at relatively low cost.

1. Introduction

The Centre for Frontier Engineering Research was established in late 1983 with a major grant from the Devonian Group of Charitable Foundations (a Calgary-based philanthropic organization), additional funding from the Governments of Alberta and Canada and the private sector, and substantial in-kind support from the University of Alberta. C-FER was created in response to industry need. Its primary mandate is to carry out research related to materials, design and construction of facilities used in the development of Canada's frontier petroleum resources. A second important role for the Centre is that of technology transfer. The C-FER Network was designed to act as a facilitator in the dissemination of existing knowledge relating to specific aspects of frontier engineering.

Considerable time was spent during the early stages of C-FER's development exploring ways in which the Network could best contribute to information transfer. Some avenues were readily apparent: person-to-person contact; workshops and seminars; and newsletters were all seen to play a part in moving information through industry, governments and universities. A fourth initiative that received consideration was an information service not unlike the Ocean Engineering Information Centre of the Centre for Cold Ocean Resources Engineering, St. John's, Newfoundland.

In the course of determining the particular niche that C-FER might fill in this field of information service, discussions were held with numerous related centres. The Arctic Institute of North America, the Boreal Institute for Northern Studies, C-CORE, the Welding Institute of Canada and the Canadian Institute of Steel Construction were among those to provide valuable input to C-FER during its deliberations. It became apparent that with a number of top quality databases already focussed on various aspects of northern and offshore information, C-FER's niche would not be in creating yet another such database, but, rather, in finding ways of facilitating the exchange of already available information.

It was at this point that C-FER and the Arctic Institute of North America first discussed the possibility of a workshop on northern and offshore information resources. For C-FER, the co-operative marketing initiative fit well into its general networking mandate: workshops had already been earmarked as one way of disseminating information at a variety of levels. For the Arctic Institute, the joint initiative was a logical part of the marketing component of the ESRF/ASTIS project.

Under the ESRF/ASTIS project, funded by the industry/government Environmental Studies Revolving Funds (ESRF), the Institute's Arctic Science and Technology Information System (ASTIS) was enhancing its multi-disciplinary bibliographic database in the ESRF priority subjects. Some of the funding provided by ESRF was earmarked for marketing of ASTIS to ensure that this newly assembled information about the Canada Lands was disseminated as widely as possible. A seminar held in collaboration with C-FER and other information providers would be a cost-effective way of communicating with a large group of users.

2. NOIR: An experiment in collaboration

The first NOIR seminar was held in Calgary, Alberta, on 2 May, 1985. It was designed to bring information professionals and end-users together to learn about available resources and methods of retrieval of information on northern and offshore regions. Participants at the seminar fell into one of three main groups: i) the speakers, information specialists working for northern information services; ii) information professionals working for industry, government agencies and universities who rely to a great extent on the information provided by northern information services; iii) end-users, research scientists, engineers, and managers who rely on either of the other groups for their information needs.

The seminar was divided into two parts: first, a half-day session geared specifically for the speakers, which provided an opportunity for discussion on the ways and means of increasing co-operative information sharing; and, secondly, the seminar itself, at which the speakers presented overviews of their particular databases or printed information sources and then took part in a user forum discussing with delegates a variety of related subjects.

The speakers' pre-session was an important component of the first seminar. Since many information providers were coming to Calgary to speak at the seminar it made sense to provide time for them to get together to discuss issues of mutual concern. Much of the discussion at the pre-session focussed on marketing, and specifically on the need for more cooperation in marketing. In addition to re-affirming the usefulness of collaborative seminars such as NOIR, the group recommended that information providers exchange and jointly distribute promotional literature, that joint display materials be prepared, and that joint exhibits at conferences be undertaken.

All of these recommendations have since been implemented. For example, during 1985 ASTIS displayed brochures for several other information providers at its booths at InterCan '85 in Edmonton, the Special Libraries Association annual meeting in Winnipeg, and the Canadian Library Association annual meeting in Calgary. AEIDC prepared a joint display for a group of six university institutes, which has since been used at several conferences. The same group of six institutes shared the cost of a booth at the Arctic and Offshore Technology Conference (AOTC) in Anchorage. AOTC and AEIDC organized an information workshop following that conference. It seems that the time was ripe for cooperative marketing, and that the pre-session at the Calgary NOIR was all that was necessary to start things moving.

The seminar itself was subdivided into two main sections: the morning and early afternoon were devoted to a review by speakers of their particular information centres or databases; the late afternoon took the form of a user forum, a 2-hour session designed to stimulate dialogue among the various groups represented at the seminar. Keynote speaker at the Calgary seminar was A. E. Pallister, President of Pallister Resource Management Ltd. His address to the gathering, entitled "Needed: An International Arctic Information System", was an excellent starting point for the user forum.

The first seminar taught us several things. We realized, for example, that the seminar would have benefited greatly from the inclusion of online demonstrations. The "hands-on" approach would have added much to the session, and it was agreed to include demonstrations in any future seminars.

We learned also that there was a need for guides or "pathfinders" to the many resources on northern information, both online and printed material. As one step in this direction, a decision was made to publish a summary of proceedings of the Calgary NOIR for broad distribution. Since then, we have committed ourselves to the much greater effort of publishing a single summary of proceedings for all four seminars.

Perhaps most importantly, we learned from both the information specialists and the end-users that there is a very real need for the sort of information exchange provided by NOIR. On the one hand, the speakers were unanimous in their view that a continuing co-operative marketing initiative would increase the effectiveness of information services both individually and collectively. On the other hand, the librarians and the end users who registered for the session agreed that it had provided them with the rare opportunity for dialogue on a subject of mutual importance. A key point made in this regard was the recognition that, to be most effective, seminars and other marketing initiatives should be collaborative in nature.

3. The evolution of a series

It was readily apparent to us that NOIR had struck a responsive chord. Fifty-seven people attended the first seminar, and before its conclusion representatives of Indian and Northern Affairs Canada had volunteered to help organize a similar session in Ottawa. So it was, then, that NOIR moved from a single experiment to become a series, to be run at several locations across Canada during the following year.

The second NOIR seminar was held in Ottawa, 2 October, 1985. Subsequent sessions were in Halifax, 10 January, 1986; and Yellowknife, 16 April, 1986. (See Appendices A and B.) The general format of the NOIR seminar series has been similar to the first NOIR, with two notable exceptions. First, there has no longer been a half-day pre-session for speakers. We felt that the purpose of that session had been fulfilled in Calgary and that further discussions amongst the speakers would occur informally before, during and after the NOIR seminars themselves. The second departure from the NOIR format was the addition of online demonstrations during the afternoon session (see Appendix C). While this has made the agendas very full, it has been a valuable addition to the sessions, as noted above.

The forum at the end of each seminar has been maintained, in order to obtain user's comments about the seminar itself and about problems in accessing northern and offshore information. Displays of sample publications, brochures, etc. have become an important part of NOIR, particularly since they allow participation by information services that are unable to attend in person. The practise of having an entertaining and informative luncheon speaker has been continued.

The agenda has varied from location to location, although a "core" of organizations has been involved in most of the seminars (see Appendix D). This variation on the initial agenda has also been by design, with each seminar tailor-made to meet the needs of the particular area involved. Therefore, in Ottawa, for example, the focus was more toward government information sources, while in Halifax the thrust was the offshore, and in Yellowknife the focus was clearly northern.

The Yellowknife NOIR was held in conjunction with the annual meetings of the Association of Canadian Universities for Northern Studies, an idea which simplified logistics and provided a larger potential audience. We also arranged for training sessions by CAN/OLE and QL Systems to be held in Yellowknife in the days before and after the NOIR, resulting in a full week of information activities. Both of these ideas should be considered for future NOIR seminars, especially if they are being held in smaller cities like Yellowknife.

The series has picked up momentum as it has continued. The response has been consistently high, with an increasing percentage of end-users at each seminar. It has been particularly gratifying to us to have received support for the seminars at many levels. While the first NOIR was strictly a C-FER/AINA initiative, each successive NOIR has had one or more co-operating sponsors, whose contributions were essential to the success of the seminar.

The Ottawa seminar was held in co-operation with Indian and Northern Affairs Canada. In Halifax, it was the Bedford Institute of Oceanography Library that co-sponsored the session. Finally, in Yellowknife three groups joined forces in support of the NOIR initiative: the Science Institute of the Northwest Territories; the Government of the Northwest Territories Library, and the Association of Canadian Universities for Northern Studies. This collaboration is a critical component of the series and will continue as the series does. Preliminary plans are now underway for an additional seminar in Edmonton, Alberta in September 1986, co-sponsored by the Boreal Institute for Northern Studies.

To acknowledge the support of those agencies who have assisted us is important. More important, however, is to recognize the particular individuals involved. In Calgary, Judith Carrie organized AINA's contributions to the seminar; in Ottawa, it was Monica Morrison, Northern Regulatory Review, and Ramma Kamra, INAC Library, to whom we are indebted; in Halifax, BIO's head librarian Betty Sutherland was an invaluable support; and in Yellowknife, Cynthia Ryan, Librarian for the N.W.T. Government, Dan Billing and Bob Janes of SINT, and Peter Adams of ACUNS were of tremendous help. To those individuals and their staffs, we say thank you.

4. Financing co-operative marketing

The first NOIR seminar was, as has been noted, an experiment in co-operative marketing. One of the decisions relating to that experiment was that we not charge a fee for the session. Our feeling was that a critical part of the experiment was to find out if, in fact, our perception was valid; that there was a need for NOIR. To do this, we wanted to draw together as many information professionals and end-users as we could. Hence, the "freebie". Co-sponsorship worked well, with C-FER picking up the "hard dollar" costs and sharing the organization and manpower costs with AINA.

Although that financial mechanism worked well, once the decision was made to turn NOIR into a series we felt it more appropriate to charge a nominal amount for the session. Our reasoning was two-fold: first, from a purely practical point of view, it was felt that both C-FER and AINA should re-coup some of the very substantial costs involved in running the seminars; and, secondly, we discovered during the user forum that there is a point of view that says that if something is of value, it is worth paying for. And so, for practical and philosophical reasons, we have initiated a small fee for the seminars ($35 each for Ottawa and Halifax; $45 for Yellowknife). By and large, the proceeds of the seminars have been put towards the travel costs for C-FER and AINA. In almost every case, speakers have paid their own expenses, although a portion of the proceeds of the seminars has been allocated to assist with these expenses, as necessary.

5. Future directions

NOIR began as an experiment in collaboration, with C-FER and AINA recognizing the importance of information sharing. The series has evolved and matured in response to the needs expressed by information professionals and end-users alike.

NOIR has clearly filled a need. What is yet to be determined is the future direction of the series. Should it continue as it is? If so, where and when? If not, what changes should there be, and why? Should C-FER and AINA continue as primary sponsors, or should we step aside and let others in the field bring a new approach to the series? Such are the questions that we are currently addressing.

Of one thing we are sure however; and that is the importance of continued co-operation in information marketing. If C-FER and AINA are to continue the NOIR series (or a variation of the NOIR theme), we will do so best with the kind of support we have had to date. If there are others who wish to pick up the marketing ball and run with, we would encourage you to do so — but to do so with the spirit of collaboration that has worked so well for NOIR.

Appendix A

NOIR Statistics

	Calgary May 2/85	Ottawa Oct. 2/85	Halifax Jan. 10/86	Yellowknife Apr. 16/86
Total Attendance	57	74	53	68
Number of Speakers	11	21	15	20
Number of Presentations*	11	20	18	19
Attendance by Organization Type				
Industry	52%	3%	10%	2%
Consultants	15%	19%	23%	8%
Government	8%	61%	42%	61%
University	19%	11%	21%	17%
Others	6%	6%	4%	12%
Attendance by Background				
Information Professionals	61%	47%	49%	32%
End-Users**	39%	53%	51%	68%

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* Sometimes two or three speakers shared a single presentation. On the other hand, speakers sometimes made a second presentation for someone who could not attend in person.

** Those whom we did not know to be information professionals were assumed to be end-users.

Appendix B

Speakers at One or More NOIR

Alice Abel	Dene Nation Library
Peter Adams	Association of Canadian Universities for Northern Studies
Don Albright	Indian and Northern Affairs Canada
Martha Andrews	Institute of Arctic and Alpine Research
Jamie Bastedo	Northern Land Use Planning Office
Russell Boals	HYDAT, Environment Canada
Ann Brennan	World Data Center A for Glaciology
Phillip Brown	QL Systems Ltd.
Bonnie Bullock	Canada Institute for Scientific and Technical Information
Heather Cameron	ASFIS, Fisheries and Oceans Canada
Serge Campion	Transport Canada
Judith Carrie	Arctic Institute of North America
Marc Charette	NAQUADAT, Environment Canada
Elizabeth Clarke	Centre for Frontier Engineering Research
Nita Cooke	Boreal Institute for Northern Studies
Deborah Diemand	Centre for Cold Ocean Resources Engineering
Mary Joan Dunn	National Library of Canada
Eileen Edmonds	Yukon Archives
George Ekins	Transportation Development Centre
Rosalie Fox	National Library of Canada
Ross Goodwin	Arctic Institute of North America
Steve Grant	Fisheries and Oceans Canada
Doug Gregory	Fisheries and Oceans Canada
Jacques Guerette	Canada Centre for Remote Sensing
Bob Janes	Science Institute of the Northwest Territories
Alfred Johnson	National Mineral Inventory; Energy, Mines and Resources Canada
Albert Joseph	Canada Institute for Scientific and Technical Information
Helen Joseph	Canada Oil and Gas Lands Administration

Ramma Kamra	Indian and Northern Affairs Canada
James Kanasy	CANMET; Energy, Mines and Resources Canada
Carolynn Kobelka	Prince of Wales Northern Heritage Centre
Claire Koven	Pallister Resource Management Ltd.
Alan Longhurst	Fisheries and Oceans Canada
Marty Lovelock	Canadian Transport Commission Library
Robin Minion	Boreal Institute for Northern Studies
Monica Morrison	Indian and Northern Affairs Canada
Gordon Nelson	Northern Studies Trust, ACUNS
Judith Nogrady	Transportation Development Centre
Laurie Nowakowski	N.W.T. Occupational Health and Safety Resource Centre
Anna Oxley	Atlantic Fisheries Service, Fisheries and Oceans Canada
Ernie Pallister	Pallister Resource Management Ltd.
Jeff Pallister	Ministry of State for Science and Technology
Leith Peterson	Dene-Metis Secretariat
Marion Pape	N.W.T. Public Library Services
Louise Power	WATDOC, Environment Canada
David Reade	GEOSCAN; Energy, Mines and Resources Canada
Ruth Rintoul	QL Systems Ltd.
Alan Ruffman	Geomarine Associates Ltd.
Cynthia Ryan	Government of the Northwest Territories Library
Jonathan Sears	Cambridge Scientific Abstracts
Andy Sherin	Atlantic Geoscience Centre, Fisheries and Oceans Canada
Michael Simmons	Tydac Technologies Ltd.
Barbara Sokolov	Arctic Environmental Information and Data Center
Betty Sutherland	Bedford Institute of Oceanography
Stephen Talko	Electronic Atlas; Energy, Mines and Resources Canada
Joy Tillotson	Institute for Marine Dynamics
Ross Wein	Fire Science Centre, University of New Brunswick
Judith Whittick	Ocean Engineering Information Centre
Margo Young	University of Alberta Library

A total of 59 people have spoken at NOIR

Appendix C

Systems Demonstrated at One or More NOIR

ASFA (CAN/OLE)	ASFIS, Fisheries and Oceans Canada
ASFA on CD ROM	Cambridge Scientific Abstracts
ASTIS (QL)	Arctic Institute of North America
AQUAREF (CAN/OLE)	WATDOC, Environment Canada
BNT (QL)	Boreal Institute for Northern Studies
BOREAL (CAN/OLE)	Boreal Institute for Northern Studies
CAN/OLE	Canada Inst. for Scientific and Technical Information
CANREG (CAN/OLE)	National Library of Canada
CENV (QL)	WATDOC, Environment Canada
CISDOC	Canadian Centre for Occupational Health and Safety
COLD (ORBIT)	USACRRFL/LCCRBP
DOBIS	National Library of Canada
GEOSCAN	Geological Survey of Canada
MNP(QL)	CANMET; Energy, Mines and Resources Canada
MNT(QL)	CANMET; Energy, Mines and Resources Canada
NAQUADAT	Environment Canada
NIOSHTIC	Canadian Centre for Occupational Health and Safety
OONL (CAN/OLE)	National Library of Canada
OOT(CAN/OLE)	Transport Canada
QL	QL Systems Ltd.
RESORS	Canada Centre for Remote Sensing
Spatial Analysis System	Tydac Technologies Ltd.
Wood Buffalo GIS	Fire Science Centre, University of New Brunswick

A total of 23 systems or databases have been featured in demonstrations at NOIR. Additional databases have been demonstrated incidentally while demonstrating online services. The online service on which a databse was accessed is given in parentheses.

Appendix D
The Core NOIR Group

Level of Participation (see below)	Cal.			Ott.			Hal.			Yel.		
	A	B	C	A	B	C	A	B	C	A	B	C
Arctic Environmental Info. and Data Center		X	X		X	X		X	X			X
Arctic Institute of North America		X	X	X	X	X	X	X	X	X	X	X
ASFA (Fish. & Oceans Can./Cambridge Sci. Ab.)						X	X	X	X	X	X	X
Ass'n of Canadian Universities for North. Studies					X						X	X
Boreal Institute for Northern Studies		X	X	X	X	X	X	X	X	X	X	X
C-CORE/OEIC/CSIIS		X	X		X	X		X	X			X
Canada Institute for Sci. and Tech. Info.				X	X	X	X	X	X	X	X	X
Centre for Frontier Engineering Research		X	X		X	X		X	X		X	X
Indian and Northern Affairs (Ott. Lib./Yel. Lib.)			X		X	X					X	X
Institute of Arctic and Alpine Research		X	X						X			X
National Library of Canada				X	X	X				X	X	X
Pallister Resource Management Ltd.		X	X		X				X		X	X
QL Systems Ltd.				X		X	X	X	X	X	X	X
Transport Canada Library/Transportation Dev. Centre		X	X	X	X	X	X	X	X			X
USACRREL/LCCRBP			X	X	X	X		X	X			X
WATDOC/NAQUADAT/HYDAT				X	X	X	X	X	X			X
World Data Center A for Glaciology		X	X			X			X			X
Yukon Archives/Beaufort Sea Library			X								X	X

Levels of Participation

A	system demonstrated
B	spoke, or had paper read
C	paper handed out or published in proceedings; and/or materials displayed

The core NOIR group is arbitrarily defined as those organizations that have participated in two or more NOIR. Membership in this group is therefore partly the result of selection by the organizers of each NOIR, and partly a function of organizations' interest and financial ability to attend. When defined in this way, and in several cases treating branches of the same organization as one, the core group consists of 18 organizations. Approximately 25 additional organizations have participated in a single NOIR, usually when held in their local area.

YUKON ARCHIVES

Eileen Edmunds

Yukon Archives, Department of Education, Box 2703, Whitehorse, Yukon Y1A 2C6 (403) 667-5321

Yukon Archives serves anyone, regardless of affiliation, who has an interest in Yukon-related topics, or in northern hydrocarbon development, particularly in the Beaufort Sea area. The Archives collects, preserves and makes available both current and retrospective documentary sources which bear upon the history and development of the territory. Three record types — government, corporate, and private records — are represented in a wide range of media: original papers; sound recordings; photographs; films and videotape; maps, plans and architectural drawings; posters and broadsides; and imprint (books, pamphlets, periodicals and newspapers). Some materials of various record types and original media are held in microform. The various collections and media are described in the general information brochure and the Beaufort collection fact sheet.

A professionally-staffed reading room is available for reference and research 32 hours per week (9:00 A.M.-5:00 P.M., Tuesday-Friday). A variety of inventories, finding aids and indexes are used to access materials. A card catalogue provides subject access to private and corporate records, as well as author, title and subject access to books and pamphlets. Perhaps the most popular reference tool is the Visual Finding Aid which presents photocopies of photographs along with their catalogue descriptions. Arrangement is by subject.

The reading room is available an additional 36 hours per week for after-hours research. Security lockers are provided to allow researchers to have access to materials normally housed in the vault.

Interested researchers may make arrangements for on-site viewing of films and videotapes held by the Archives. At present, most of the film collection is in the process of being converted to videotape (VHS). Once conversion is complete, videotapes will be available on loan. In this way, the Archives can balance preservation needs with the immediate research needs of those who are unable to visit the facility.

Professional staff provide reference service by mail and telephone to researchers who cannot come to the Archives in person. Anyone who plans to conduct extensive, in-depth research in the Archives would be well advised to write or telephone in advance with a brief outline of his or her topic. Advance preparation improves the efficiency of reference service, and allows the researcher to make more profitable use of the time available.

As no materials circulate, a photocopy service is provided, at fifteen cents per page. Copying of maps, blueprints, architectural drawings and other oversize materials is co-ordinated through a local graphics and print shop, according to its own fee schedule.

Interlibrary loan requests are filled either by photocopies or by referral to the public library, which has a northern collection of general-interest titles only. Researchers and borrowing institutions are well advised, then, to try to locate titles in circulating collections before contacting Yukon Archives. Most volumes of the *Yukon Bibliography* include the locator symbol YA for titles held by the Yukon Archives.

Table I is a list of the Archives' finding aids and bibliographies.

Table I — Finding Aids and Bibliographies available from the Yukon Archives

Bibliographies

Ben-My-Chree
Klondike Kate
Alaska Highway
Genealogy
Whitehorse Copper
Martha Louise Black
Dalton Trail

Corporate Records

Anglican Church, Diocese of Yukon
Arctic Winter Games

Government Records

Municipal

M.R.G. 2 Dawson City (in process)
M.R.G. 3 Faro
M.R.G. 4 Mayo (in process)

Territorial

Series 1, Central Registry Files, 1894-1951
Series 2, Central Registry Files, 1898-1950
Series 3, Yukon Game Branch, 1898-1950
Series 4, Central Registry Files, 1900-1957
Series 5, Whitehorse Agent, 1898-1964
Series 6, Whitehorse Mining Recorder, 1894-1973
Series 7, Central Registry Files, 1898-1951
Series 8, Miscellaneous, 1894-1972
Series 9, Game Records
Series 10, Placer Mining Records (Federal)

The Archives has published a number of bibliographies, research guides and finding aids, all of which are available free of charge. Recent additions to the list include a bibliography on the Dalton Trail, and finding aids to the Anglican Church (Diocese of Yukon) records, and to the Arctic Winter Games records.

The Beaufort Bibliography is a major reference tool in the final stages of preparation. This annotated bibliography includes all Yukon Archives' titles on northern hydrocarbon development and its effects, with a special emphasis on the Beaufort Sea. Subject, author and title indexes provide references to numbered citations, which are organized in thematic chapters. Brief citations for analytics are cross-referenced to full citations for complete works. Yukon Archives' location numbers are included, to speed reference and interlibrary loan service.

Yukon Archives also distributes, free of charge, to interested institutions and individuals, Beaufort collections acquisitions lists. Entries are fully catalogued.

Another reference tool which is near completion is a checklist of Yukon newspapers, with holdings information. Listed are all known mastheads published in the territory: commercially-produced newspapers, community newsletters, school newspapers and the bulletins and newsletters of societies and organizations. Arrangement is by community of publication, with cross-references from titles. Locations include the Yukon Archives, the National Library of Canada, the Glenbow-Alberta Institute Archives, the University of Washington Libraries, the British Columbia Legislative Library, and the University of Alberta Library. Yukon Archives plans to update the checklist periodically. It is hoped that other libraries, archives, museums and the researching community will keep us informed of additional copies, locations, and perhaps hitherto unknown mastheads.

Under contract to the Management Committee of the Economic Development Planning Subsidiary Agreement (Canada Yukon), Yukon Archives is preparing an annotated bibliography of Yukon economic planning studies. The coverage is all Yukon-specific sectoral and regional economic planning studies (initiatives of both private and public sectors). Arrangement and indexing is similar to the Beaufort Bibliography.

For any of the lists or guides described here, or for additional information on Yukon Archives' collections or services, contact the author. Requests for Beaufort information or publications should be directed to the attention of the Beaufort Librarian, at the address and telephone number given below the title of this article.

POT OF WRITTEN GOLD
THE DENE NATION LIBRARY/ARCHIVES, YELLOWKNIFE, N.W.T.

Alice Abel
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History of Dene Nation

Prior to the arrival of the Non-Dene we, the Dene people of Denendeh had everything that makes us a distinct people, we had our own history, our own education, our own religion, our own justice and political process and we had our way of perceiving the world. It's a way of saying we were a Nation of people. In the past, the Dene of the five tribes were scattered because they lived on the land to make their living and some still do. But as time changed so did the lifestyle of the people. So they decided to join and form an organization.

In the year 1969, the Indian Brotherhood was formed in the Northwest Territories. This is a political organization to represent the Treaty Indians of the five tribes: Dogrib, Chipewyan, Southern Slavey, Northern Slavey, and Loucheux. By researching Treaties # 8 and # 11 signed by the Federal government with the five tribes, they started negotiations with the Federal government on land claims and protection of Aboriginal rights.

In 1975, they declared themselves to be a nation within Canada with the right to self-determination, changing their name from the Indian Brotherhood of the N.W.T. to Dene Nation as it is called today, to represent all Dene and their descendents of the five tribes. At this time, a more comprehensive land claims negotiations team was formed. Today, we are still fighting for the rights to our land and resources as negotiations goes on.

Through the 'Land Claims' process with the Federal Government, it is our objective that we be recognized as a Nation and be treated as such so that we can survive as a people and once again be given control of our future. No, maybe that's not what the Canadian government have in their minds, they'll work to find ways to continue controlling and trying to take everything away from us, so that we won't exist as a distinct people with our own heritage and culture.

This is an excerpt from "When freedom Is Lost: the Dark side of the Relationship between Government and the Fort Hope Band."

> In 1969, in a rush to redress the serious social and economic wrongs Indian people were facing across the country, the newly elected Liberal government released its White Paper on Indian policy. Since recently discovered evidence indicates that Liberal policy-makers may have been guilty of imitating outdated United States government documents when they designed the White Paper and then applying the contents haphazardly to a completely different situation in Canada, it is impossible to tell whether or not they were acting in good faith. One thing is certain: there is absolutely no doubt that the White Paper resulted in a massive flow of new make-work job-training and community development programs into the Fort Hope Band and many other isolated Indian bands. The problem was that these programs did not strengthen the Indians' economy. Under the new policy dependency has only increased, and this has left the people in the Fort Hope Band more vulnerable to government cut-backs than ever before.

The Fort Hope Band in Northwestern Ontario is in an extremely vulnerable position just like the Dene communities in the N.W.T.

Background Information on the Library/Archives

The Dene Nation Library/Archives has been in existence for many years to provide library and information services to staff members, researchers, consultants and (26) twenty-six Dene communities in the N.W.T. Services to the public have been provided sporadically. Because of unstable and inconsistent sources of funding for the Library/Archives, there was often no one qualified to operate and maintain an efficient information service for the library user.

The library/archives consists of a highly specialized collection of documentation on issues relating to the land claims settlement dating back to when the Dene Nation was established and also cultural materials. During the years due to high staff turn-over in the library, there was a tremendous backlog of materials that became very difficult to organize and arrange to be classified. The holdings of the collection have no special classification system since some of the people who worked in the library had no skills or experience to really develop an efficient system.

On November 21, 1983, Ms. Leith Peterson, (see elsewhere in this volume) who has a Library Technician diploma, management and secretarial skills, and who also has done numerous Library Training Programs in native libraries in Ontario and here in Yellowknife, was hired by the Dene-Metis Secretariat to reorganize library and information services, develop efficient classification schemes for the unique holdings of materials and to train me in native library and information work. I have successfully completed a one and a half year Library and Information Training Program that was sponsored by the Northern Careers Program.

Over the past 3 years, since the library/archives has been in full operation, there has been a tremendous improvement in the library's appearance and organization, the result of many hours of overtime and having after school programs, Youth Training Option Program and one part-time person. At the present time there is myself, Library and Information Officer/Dene Nation, Mary Kodakin, a Dene, Library Clerk/Dene Nation, Leith Peterson, Project Manager/Library Clerk Training Program, Canadian Employment Development Branch (EDB), being administered through the Dene-Metis Secretariat and Tina Sangris, a Dene, Library Clerk Training Program/EDB.

The library/archives deals with published, but mostly unpublished material, reports, minutes of meetings, material written by Dene Nation, Dene-Metis Secretariat staff, reports done by resource people and consultants, important historical and cultural materials, audio cassettes, reel-to-reel tapes, video cassettes, annual reports, books, periodicals, newspapers, newsletters, reference books, and mapping materials, etc. The library/archives staff have succeeded in organizing and classifying a large portion of these materials in subject arrangement and at the same time helping the staff, resource people, Chiefs and Band Councillors from communities with information requests.

Present situation

Because of the political pressures placed on the Dene-Metis and the urgent nature of their requests, providing library services and information efficiently is a challenge. A lot of requests have been received by the library/archives from the public, but the library staff are not mandated to answer these requests without permission from the Executive Director of the Dene Nation, or the Executive Director of the Dene-Metis Secretariat, if it has to do with land claims.

The library/archives recently obtained a MacIntosh 512K computer with a printer. There is an enormous backlog of material which needs to be indexed and the computer comes in very handy for that kind of work. The Dene-Metis Secretariat has purchased a MacIntosh computer for this project and Employment Development Branch is paying for rental of this computer for one year.

The highly-specialized and complex issues contained in the documents have presented cataloguing/classification difficulties because the standard library classification schemes (eg. Dewey Decimal, Library of Congress) are not designed for native libraries, thus there are no standard classification/cataloguing rules for our types of materials.

We have also been in contact with the Archivist at the Territorial Government Archives, regarding what systems are used by Archives. In addition, all the staff have toured the Territorial Archives. We also have read the book Native American Archives: an Introduction, which we found very useful. We are planning to contact Native American archives which have been established for some time, for their ideas as well.

Because native materials are so unique, a system must be designed which meets the special needs of the native peoples. We can get ideas from other native libraries/archives, as well as from our own experience.

One of the major concerns is subject headings presently assigned to native materials. These are often not specific enough although there have been definite improvements over the last few years. Many Canadian libraries recognize that there is a need for improvement in terms of subject headings for native materials.

Planned feasibility study

Most of the information documented on papers and tapes on the Dene struggle for self-determination and self-government are archival materials which are important to the Dene people. The Dene and Metis Leaderships have passed resolutions recommending that a feasibility study be done re the establishment of a native library/archives in Yellowknife. A proposal was submitted to the N.W.T. Secretary of State for funding. The results from the feasibility study will be looking at the future of the Dene Nation Library/Archives and the Metis Association Library/Archives, also in Yellowknife. If it is decided by this feasibility study that this native library/archives should be established, than all of these materials in the library/archives would be accessible to the Dene and non-Dene people. This will help Dene children/students to know more about their heritage and culture, and be proud of their people and who they are. Also it would benefit the non-Dene people to understand and respect the Dene's culture.

We are very grateful that the Dene and Metis leaderships passed resolutions unanimously supporting a feasibility study re the library/archives. Their children and grandchildren will be grateful because the unique collections and valuable information is of long-term significance to the Dene people in terms of the present situation and is consequently of historical and archival importance for future generations. These materials could be used as curriculum materials for schools. The library/archives could serve as a branch of the education system.

Dene people have been saying that the Dene Nation library/archives is like a bank, like a pot of gold for Dene people. This library/archives is a resource, just like land and resources.

A system for native libraries and archives can be developed under native control. The Dene and Metis can learn from the methods that the non-native libraries and archives have developed, but also the non-native libraries and archives can learn from the Dene and Metis.

Educational aspects

When native people go to school and they only learn the non-native ways, without knowing or understanding who they are as native people, or the history of native people, then the education system often fails them. The educational system is only oriented to the European style. There is a better way to educate than simply following the European model. If a person doesn't know who they are or if their own history and background is belittled and not recognized by the educational institutions, then the person doesn't learn as well as he/she could. But if a person knows who he/she is, and that person's history and background is respected, then the learning process is much more satisfactory.

The youth of Denendeh are expressing their concerns and problems to the public through conferences, workshops, newspapers, and the media. Here is an excerpt from a letter to the editor of Native Press, by Peter Squirrel, a Dene, April 11, 1986:

> "Let's have something that will have a lasting effect on the Dene. Something which will give them a recognized identity base from which to work and enter into events that control the never-ending goals of the self-determination and self-government for all aboriginal peoples... The present educational curriculum that I was introduced to in our school system had no real meaning for me. I'm not knocking the opportunity that made me the person I am this day. It's just that, as a Dene, I learned that whatever I was being taught in grade school didn't apply to the present situation of the Dene in the NWT... Was I, at an early age, introduced to Native Teachers and material written in the aboriginal languages so I could better understand my identity and culture? Did I learn about self-determination and self-government goals to be reached by aboriginal peoples of the world? Where did my destiny lie? Would I be recognized with human rights in a non-Native society?
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> Why did I learn all this later in life? From the time that we emerged from grade school most of these questions should have been dealt with so that I or any one of us could make wiser decisions in our affairs... Can we have it on our conscience to have ignorant Dene uninformed about actions and events that affect their very chances for survival?... This concept takes into mind the Metis and Inuit peoples too. The Native leaders and education authorities could be looked at to provide the "particulars" on Native control, with the ideas and questions in mind to find what is missing in making our people stronger."

What is missing in making our people stronger is the written and audio visual resources, which are not presently available to any great extent in the education system for the Dene. The Dene Nation Library/Archives contains materials, which would be used as the basis of educational curriculum materials.

Special systems for native libraries/archives

The Dene and Metis have observed over the time since colonization, that systems developed, eg. educational, library, etc., have supposedly been developed for the use of the Dene and Metis, but this method has not helped the Dene/Metis gain more control over their lives. If the Dene-Metis continue to use the present system, what will they be offering the generations of Dene and Metis yet to come?

This is a quotation from my speech to the Dene Nation National Assembly, Fort Franklin, July 1985.

> "Native people must be able to develop their own libraries in their own way. The non-native way is not designed for native materials. The development of library services for the use of natives must be in the hands of native people in order to provide better and more efficient services to meet their needs. So, it is very important for native students to get trained in library and information services. Why? Because if the Dene are talking about self-government, then we have to control our own information resource materials, such as preserve and enhance our cultural values and traditions, history, language, education, economics, health, etc. This is the kind of information which will give the Dene struggle more power. Information is a powerful tool. To ignore the power of this tool is to weaken the development of self-government. If we don't take control over our own information needs, then the non-native people will, like anything else."

Many native people have not used libraries/archives as often as they could in the past because there was something frightening about these institutions. Perhaps there was a fear of gaining knowledge and learning the truth. Perhaps there was a fear learning would require too much work and would be stressful. But now things are changing. More and more native people are aware of the fact that in order to have more control over their lives, they have to learn the truth and learning the truth requires doing a lot of research and studying.

The Dene tradition is an oral tradition. Before Dene people were not used to written history, but now they know it is important for them to continue to put information about their struggle on paper and tapes. Some of these tapes and transcripts are the only records of the wisdom of the elders who have long since passed away. The library/archives is the main resource to keep all these documents and files for future reference to the children and youth of Denendeh.

Don't worry about perfection in the beginning. It's going to be a long, slow process, but what's important is to get control of the material now, before the control is lost. Perfection in training, etc., will come with time. What is the point of collecting all these files and books if in the final analysis, the Dene and Metis have no control over them? Some native libraries have already been sold to non-native libraries, because proper planning didn't take place, eg. Canadian Association in Support of Native Peoples library.

Over the last 30 years, the non-native people have been studying the Dene people in the North to find ways of improving the Dene lifestyle, such as health, education, religion, etc. These studies done on the Dene people have complicated and confused the Dene because their lifestyle has been dramatically changed as a result of the dominant society.

Certain factors in the history of native people, particularly alcohol abuse, have caused such deterioration in individual native communities, it was almost like the communities were asleep. Now more and more native people have stopped drinking or are becoming aware of the dangers of alcoholism, as it has been affecting the mind, body and spirit to be as a whole person. One of the first steps of those people who have taken control over their lives again is that they look at their past experiences and tell other native people of the pain and suffering that they have experienced. This is in order to warn the other people of this pain and suffering, so they will not follow a similar route.

Many native communities are healing or are gaining in awareness of the dangers of alcohol. Once this healing has been completed, the need for knowledge will be even greater than it is now. Now that this healing process is recognized, it is very important for libraries and archives to be included in the land claims now because if they are not included now, the ability for native people to regain control could be lost.

The native people have been saying all along that the sources of strength rooted in their language, culture, spirituality, tradition values and the land, serve as a basis to meet the needs to survival as Dene people. This traditional world view provides a direction and framework which can guide their efforts in rebuilding and strengthening their communities from a traditional perspective into the modern society.

Non-Dene people should be studying themselves to find ways to work and cooperate with the Dene people in the political process.

Dene people who go to universities and colleges can help by sending their theses and other reports relating to their culture, to the Dene Nation Library Archives.

Excerpts from Native American Archives: An Introduction:

p. vii-viii: The record of history clearly holds lessons about how much and what type of growth can be sustained in a given area. How well that record is read and heeded in planning and development in both Indian and non-Indian communities in America's Sun Belt is a critical issue. The organization, maintenance, and utilization of tribal archives can serve the broad and critical need of tribes for comprehensive community planning and program development.

p. vii-viii: The investment of time and personnel in such projects may well be the most important effort in American Indian community development today. It is an investment in sustaining the living memory of a people. It is equally a foundation for future development of a society.

p. 4-5: ... a tribal archives places these resources in Indian hands, and thus encourages interpretation of tribal history from an Indian perspective. The American Indian, writes the historian William T. Hagan, has been an "archival captive" because to be an Indian is "to have non-Indians control your documents from which other non-Indians write their version of your history". A tribal archives is one means to reverse this situation and to give substance to the goal of Indian cultural self-determination.

p. 5: Too often, potentially valuable resources such as these are inaccessible and even lost to the tribe because no archives exists to care for them. By self-consciously gathering materials as they are produced, an archives creates a record by which future generations will understand the great changes taking place in all areas of Indian tribes today.

Quotations from Coolican report:

(excerpt from letter to David Crombie)

p. iii.: The new policy should encourage aboriginal communities not only to become economically self-sufficient but also to establish political and social institutions that will allow them to become self-governing. The two must develop together because political power is meaningless without the backing of financial resources.

p. iv: We recommend a new policy based upon a relationship of sharing of power and resources. The previous pattern of land and cash settlements would be far simpler, because it is easier to negotiate and deliver terms related to cash or areas of land, in which amounts are quantified and dates are established for the transfer. A transfer of power, however, is far more difficult to achieve. To be prepared to give up jurisdiction and to change its own decision-making structures is one of the most difficult challenges for any institution the size of the Government of Canada.)

(excerpts from objectives of the Task Force:

p. 31: preserve and enhance the cultural social well-being of aboriginal societies for generations to come; and

enable aboriginal societies to develop self-governing institutions and to participate effectively in decisions that affect their interests.)

p. 65: Modern claims agreements must help to restore and develop economically viable aboriginal communities. The agreements must be flexible enough to accommodate changes in the opportunities for economic development.

p. 70: ...we must abandon the notion that large quantities of cash will meet the needs of aboriginal peoples. Cash was not the answer 100 years ago, and it is not the answer today. Far more important in contributing to lasting benefits are the establishment of political institutions, access to resources, and the sharing of future revenues from the land.

p. 71: Many aboriginal groups emphasized the urgent need for training programmes to prepare them for the responsibilities and opportunities that a comprehensive agreement would bring...Education and training.

It was indeed a relief to read the Coolican report. This is the kind of report we needed in support of native people. I hope you get a chance to read it, as it underlines many of the concerns I have brought to your attention today.

Sources

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Note

Readers are urged to consider depositing appropriate materials in the Dene Nation Libary/Archives. ACUNS has already formally asked its members to do so. (ed.)

FURTHER OBSERVATIONS ON THE DENE NATION LIBRARY/ARCHIVES

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I am Project Manager/Library Clerk Training Program with the Dene-Metis Negotiations Secretariat. I am responsible for training two Library Clerks. This one-year project is mostly funded by Employment Development Branch. We appreciate the fact that Employment Development Branch recognized the importance of the work we are doing.

I would also like to thank the organizers of this seminar for inviting us to speak here. You might find some of the things I have to say here a bit blunt, but anyone who knows me will tell you that's my usual style with everybody.

The Dene-Metis Negotiations Secretariat was formed around November 1983 to negotiate the land claim on behalf of the Dene Nation and Metis Association. As the Secretariat is not a legal entity and therefore cannot really own anything, it was decided in October 1984 that materials collected by the Dene-Metis Secretariat would now and eventually be deposited in the Dene Nation library/archives. The Metis Association also has a library/archives and I am mostly responsible for it as well. I hope to train someone to look after the Metis library/archives on a regular basis.

Even though this isn't my land claim, I feel it is in my interest and the interest of all Northerners, librarians and archivists, to encourage native people to control their own libraries and archives. Many native groups in the States control their own libraries and archives. Even Ronald Reagan passed legislation affirming native self-government in 1983. Under the Indian Self-Determination and Education Assistance Act, U.S. native groups have control over their own records and some native libraries and archives have been in existence for decades. As John Fleckner states in his excellent book, Native American Archives: an Introduction:

> The investment of time and personnel in such projects may well be the most important effort in American Indian community development today. It is an investment in sustaining the living memory of a people. It is equally a foundation for future development of a society ... A tribal archives places ... resources in Indian hands, and thus encourages interpretation of tribal history from an Indian perspective. The American Indian, writes the historian William T. Hagan, has been an "archival captive" because to be an Indian is "to have non-Indians write their version of your history". A tribal archives is one means to reverse this situation and to give substance to the goal of Indian cultural self-determination.

Preservation of the Dene/Metis heritage is already part of the land claims process. The Dene and Metis libraries and archives fall under a section of the land claims agreement which deals with records relating to the Dene/Metis heritage. The federal and territorial governments have already committed themselves to working out an arrangement with the Dene and Metis regarding this important issue. Just at the point where a resolution of this matter is imminent, it appears that Deputy Prime Minister Erik Nielsen is intent on cutting off funding to comprehensive claims groups.

Some of you might say, Erik Nielsen is right; our policies towards native people have failed. Let's get out our shredders, let's eliminate native programs and forget it all happened. It's embarrassing for non-native people. Let's put our blinders on. Certainly, no one can deny that billions have been spent on native programs, but many of us know that a lot of this money doesn't really reach native people. It gets sucked into the insatiable, administrative vortex of various agencies who administer native programs. There never seems to be enough money to do it right, but there always seems to be enough money to do it over. A lot of this money goes to unnecessary studies. Native people have been studied to death. It's about time we stopped studying native people and started listening to them instead. We are aware that there are many, many, principled, sincere and dedicated non-native people within government, industry and business who have only the best interests of native people at heart. Often the "reward" for being principled is you are harassed and intimidated by some of your own non-native people. Supporting native issues can be a very isolating experience, but supporting the status quo can be even worse.

I have known native people most of my life. I have worked in native organizations in Northern Ontario, Southern Ontario and here. In fact, this is the second time I've worked in Yellowknife. I also worked for the Dene Nation library about 10 years ago. My employment with native groups has mainly been in the library field, but I also was involved in native support work, native crafts, human rights concerns, management and secretarial work with these groups. I have worked with political, cultural, band, Status, Non-status/Metis, and friendship centre native organizations.

It absolutely makes my blood boil when I read sections of the Nielsen report relating to the concerns over the proliferation of native organizations. Who caused this proliferation of native organizations? Who in most cases insisted that Status be separated from Non-Status? Who in most cases insisted that cultural organizations be separated from political? I remember occasions when I was working in native support work, when native cultural centres and friendship centres would refuse to house native political events, because they were afraid it would jeopardize their funding. How convenient. Divide and conquer.

And don't tell me I don't have the right to say this because I'm non-native. Cece Macauley, the well-known contributor to our NWT newspaper, News/North, said in a recent column, "it takes a native to smarten a native". Well, sometimes it takes a non-native to smarten a non-native, too. As a non-native, I often see through the subtle little games of my own people. There are some incredibly shrewd civil servants and industry officials around who know every trick in the manipulation book. They move native people around like chess pieces. The fact is that native people are getting too smart and that's why the plug is being pulled on a lot of native programs.

Some of you are probably saying, yes, but aren't native people to blame for some of this misfortune? As many native people who know me are aware, I am not afraid to make my opinions known to native people when I disagree with what they do. But to me, a good, rip-roaring argument is a heck of a lot better than the subtle, hypocritic backstabbing I see some of my non-native associates engage in. Don't forget either who native people learned some of their political methods from.

You are probably asking, what does all this have to do with native libraries and archives? Everything. We are down to the wire here and it's the Nielsen report versus the Coolican report. It was indeed a breath of fresh air to read many of the statements in the Coolican report. I hope you put it on your reading list.

Native people have the right to control their own information. A lot of the material collected by the Dene-Metis Secretariat, Dene Nation and Metis Association was produced by native people. Native organizations have been experiencing tremendous anxieties lately because of the threatened or actual cuts in their programs. When Alice Abel, Library and Information Officer/Dene Nation (see elsewhere in this volume) heard of these cuts and the possible loss of the Dene Nation/library archives, she said "they're trying to take everything away from us". The irony is that native libraries and archives can save native organizations and the taxpayer a lot of money in the long run. By helping to ensure that important documents can be retrieved, important research is not repeated, money is saved on duplication (because material is recycled) and a documentation of the land claim is created.

Native libraries have recently been having all kinds of difficulties on the national level when they lobby with national library organizations. Promises were made to us last year but so far we've mostly been getting the runaround from these organizations. Unlike most of the negative recommendations in the recent Nielsen report, there is a recommendation that the National Library of Canada stick with published material and leave unpublished material to the Public Archives. We hope the National Library will heed these recommendations as this will make it easier for us to know who to deal with, as in the past the issue of jurisdiction was clouded when the National Library tried to extend its jurisdiction into maps, the papers of literary and musical personages, and other areas covetted by the Public Archives.

Things are never going to get better if we continue to play games with native people. A lot of time, energy and money is expended on lobbying simply to maintain the existence of native libraries and archives. We have heard a lot of flowery words and empty promises. We are very grateful that you have asked us to speak here today. Please remember that we are tired of postures and politics. Don't promise us things you aren't prepared to deliver.

Many groups, such as the ones represented in this room, are very interested in when we will be open to the public, and in fact have already been asking us for information. We need time before we will be capable of handling public information requests. As anyone who has visited the Dene or Metis libraries/archives will readily verify, there is a mountainous quantity of information which still needs to be organized. This is because library and archival services were not really a priority with the Leaderships until recently. There's no use in us providing a service or saying we can provide a service until we have the political mandate to do it and we are set up properly to do it. In the meantime, we want to thank those libraries and archives who have graciously offered their services and expertise to us over the years.

The process of establishing native libraries and archives in Canada is going to be a gradual, but steady, process. Why not allow native people that time? Why not assist them financially, help train them? There are at least four native people in Canada with Library Technician and Librarian diplomas. There are even more who have extensive experience in library and archival work through on-the-job training. This sort of thing should be encouraged. Actually, we will all benefit because native people have and will gain important skills and expertise in the process of establishing and maintaining their own libraries and archives. Supporting a project like this is a lot cheaper in the long run than supporting hundreds of uneducated native people on welfare.

Both the Dene and Metis Leaderships have passed resolutions recommending that a feasibility study be done re-establishing a native library/archives in Yellowknife. There are numerous matters which this study will have to address, including: whether the Dene and Metis libraries/archives should be combined, where the libraries/archives could be located, what systems the libraries/archives could use, eg. classification/cataloguing, and how the libraries/archives could relate to the Dene Cultural Institute. We have submitted a proposal to the NWT Secretary of State regional office and they are 100% behind this proposal. All we need now is approval from Ottawa. Why not write a letter to Peter Globensky at the Secretary of State office in Ottawa recommending that this study be funded?

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NORTHWEST TERRITORIES ARCHIVES LIBRARY, PRINCE OF WALES NORTHERN HERITAGE CENTRE, YELLOWKNIFE, N.W.T.

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The Northwest Territories Archives Library is located in the Prince of Wales Northern Heritage Centre, Yellowknife, a facility which houses the Territories' largest museum and the Territorial Archives. It was essentially established as a library in 1981 when the first librarian was hired to organize a collection of 5000 titles that had been purchased by or donated to the Heritage Centre. Since then, an average acquisition of 300 items per year has increased the collection to about 6500 titles.

The library's mandate is two-fold. As Archives Library it serves as a repository for the published history of the Northwest Territories and, as the in-house research facility for Heritage Centre staff, it provides informational support to archaeologists, curators, administrators and other heritage resource management personnel. The library is also well used by members of the general public and by other territorial government employees.

The primary subject focus of the library's collection is the human history of the Northwest Territories. Materials are collected as comprehensively as possible in the areas of historic and prehistoric archaeology; ethnography of indigenous northern cultures including linguistic studies and folklore; arctic exploration including north polar exploration; fur trade and arctic whaling where relevant to the N.W.T.; observations and reminiscences of persons living and/or travelling in the territory; transportation, particularly those forms that are unique and/or exceptionally important to the north; history of territorial government and administration; and works about art created by territorial residents, or in which aspects of the Northwest Territories are the subject. As appropriate, material on current topics of special interest or importance to the territory are also collected comprehensively. Instances of these might be literature arising from the fall of the Russian satellite Cosmos 954 over the territory in 1978, or from the proposed division of the N.W.T.

The Archives Library boasts a fine special collection of about 500 volumes, most of which date from the nineteenth century era of arctic exploration. A few are earlier. Journals and narratives resulting from the search for a Northwest Passage are, of course, well represented as are those written by individuals who participated in the various midcentury Franklin search expeditions. Of particular interest to the historian/bibliophile is the arctic library of Admiral Sir Leopold M'Clintock, himself a participant in the Franklin search and author of two of the titles in the collection. Through encouragement offered by former Northwest Territories Commissioner Stuart Hodgson, Sir Leopold's great-grandson Nicholas M'Clintock donated the library to the Heritage Centre in 1979. A second notable contributor to the special collection was British Rear-Admiral Noel Wright whose particular interest lay in the Franklin searches, about which he wrote two books.

These accounts and narratives by arctic explorers can be of considerable value to researchers in social and natural sciences alike because the nineteenth century fascination with arctic exploration extended to an interest in both northern native peoples and the natural environment. Descriptions of Dene and, particularly, Inuit culture abound, providing a wealth of information to archaeologists and anthropologists. In addition, expeditions frequently included a naturalist among their members. Meteorological, astronomical and magnetic observations were commonly made and the data appended to the narrative of the expedition. Flora and fauna were very carefully described; earth sciences received less attention, but appear in a few accounts. To the researcher who requires an historical perspective, perhaps for comparative purposes, nineteenth century accounts can prove helpful.

The library's secondary subject focus reflects its role as museum research facility. Materials are acquired in the areas of museum management, collections care and management, exhibition and design, interpretation and education, photography, librarianship, oral history, archival studies, archaeological method and theory, cultural policy, cultural and heritage legislation, preservation of heritage sites: in fact any area of museology and historic resource development that may be required from time to time by Heritage Centre staff. Also in support of their endeavours, the library houses a selective collection of material in the natural and earth sciences.

Monographs comprise the largest part of the collection, but the library also acquires serial publications, reprints, theses and dissertations, selected standard reference materials such as the *Canadian Encyclopedia*, relevant catalogues, bibliographies and indices, and government publications emanating from jurisdictions other than the N.W.T. The Territorial Archivist has assumed responsibility for the acquisition and maintenance of territorial government publications and of newspapers published within the territory.

Where possible hard copy is preferred, but microforms are acquired when necessary.

Because one of the functions of the Archives Library is to preserve the published history of the N.W.T., the collection is, necessarily, non-circulating either to individuals or other libraries. We do, of course, provide reference services to anyone requiring information appropriate to the collection, and all materials held by the library are available to those who are able to come to the Heritage Centre to use them.

At present the Library is not automated, however efforts are currently being made to rectify the situation. It is fervently to be hoped that within the next few years we will have access to southern bibliographic databases as well as having many of our in-house functions computerized.

In the meantime the job of cataloguing the collection, initiated by my predecessor, continues. Those of you who are information specialists can well appreciate just how time-intensive it can be, especially in an unautomated situation. About one third of the materials in the library have now been catalogued using standard Library of Congress classification and subject headings.

The Archives Library presents the full range of joys and frustrations common to all one-person libraries. But it also presents the challenge of what is, essentially, pioneer librarianship; of being on the ground floor in the development of a facility that will document, in part, the human history of the N.W.T.

I would like, at this point, to tell you something about the facility that completes the historical documentation picture, the Northwest Territories Archives itself. Its collection of unpublished sources of information includes historically significant records which originated with divisions of the Government of the N.W.T., with N.W.T. organizations and with private citizens. These take the form of written documents, photographs, tape recorded oral histories, maps and plans, videotapes and motion picture film.

The earliest documents relating to the N.W.T. are to be found, unfortunately, in other institutions. Most of the explorers, adventurers and scientists who visited the territory returned with their records to their countries of origin. Hence their archives are housed in such far flung institutions as the Scott Polar Institute in Cambridge, England, and Dartmouth College, N.H., in the States.

The first extensive set of records on the north is that of the Hudson's Bay Company which established posts in the Mackenzie Valley and southern Great Slave Lake area early in the nineteenth century. Company agents were joined some 50 years later by missionaries, first Roman Catholic, then Anglican. The records generated by these institutions, like those of the explorers, are for the most part, housed outside the Territory.

Since very few other nineteenth century records exist, the N.W.T. Archives has been free to concentrate on those which chronicle the events of the recent past, but even this has had its difficulties. The colonial pattern of development witnessed in the last century continued into the 20th. Government and other activities were almost invariably initiated and managed from the south and, again, that is where most of the official records are today. The Archives is, however, taking action to recover personal papers accumulated by individuals who lived and worked in the territory. Negotiations are currently being made with Robert "Bud" Orange for his papers which were generated during the years he served as an administrator with the Department of Northern Affairs and, later, as one of the first M.P.'s to represent the Northwest Territories in Parliament. An interesting set of papers already in the Archives is that of John Armour Knox, game officer, barrenlands traveller and trapper who was active in the north during the first half of this century.

Particularly well represented amongst the Archives' holdings are records documenting the evolution of Yellowknife from a small mining town in 1934 to the government, transportation and communication centre it is today. City of Yellowknife records are housed in the Archives as are numerous acquisitions from long-time residents.

The Archives' photographs are, perhaps, the most valuable of its holdings. These include over 1300 images taken by Bishop Archibald Lang Fleming during the '20's, '30's and '40's from right across the territory; a collection from Louise Buffum who lived in Fort Rae in the late '30's and early '40's; author Doug Wilkinson's photos of the eastern arctic; photographer Henry Busse's images of Yellowknife; and Richard Finnie's of the Canol Project and Mackenzie Valley.

The Archives is only just beginning to acquire records created by native people and which record the history of the N.W.T. from their perspective. Recent acquisitions from heritage projects initiated by residents of Fort Good Hope and Fort McPherson have resulted in several hundred photographs added to the Archives' holdings. A particularly significant acquisition was made last fall when the Archives received the records of Stephen Angulalik, an Inuk who operated a trading post in the Perry River area from 1927 to 1957. Not only were there almost 500 photos, but written documents which relate to Angulalik's management of the post as well.

Because so much of the human history of the N.W.T. resides in the oral traditions of native peoples, there is considerable interest in recording oral histories. Policy is currently being developed which will allow the Archives to more actively encourage the creation of aural documents, promote standards and train people in documentation techniques.

The Archives' holdings of territorial government records are, at present, modest. It is only since 1967, when a territorial civil service was created in Yellowknife, that administrative records pertaining to the N.W.T. were generated in any appreciable quantity within the territory. Although government departments are now legally obliged to surrender records which are 30 years old to the Archives, few have arrived and been made available for public use. The orderly transfer of retired records from the government's record centre, where they are now held, is expected to begin within the next couple of years.

In the meantime, the Territorial Archivist is attempting to build the Archives' holdings of official records chronicling the N.W.T.'s colonial past by acquiring copies of those federal government records which are concerned with the administration of the territory from the earliest times to the present.

The Archives is seven years old, the Library five. Acquiring the books, manuscripts, records, photographs etc. necessary to document the history of the N.W.T. is a slow process; however, their combined collection of published and unpublished sources of information will one day be a valuable resource to citizens of the N.W.T. and southern scholars alike.

I would like to gratefully acknowledge the assistance of David Rudkin, Territorial Archivist, and Richard Valpy, Assistant Archivist, in the preparation of this report.

Note

Readers are urged to consider donating appropriate materials to the NWT Archives Library. ACUNS has already formally asked its members to do so (ed).

THE NORTHWEST TERRITORIES ARCHIVES AND NORTHERN RESEARCH

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Despite the common perception of archives as cultural agencies, it should be remembered that they are most often set up to serve interests other than those of the research public. Governments and other sponsor bodies frequently establish archival repositories primarily for administrative purposes and only incidentally as scholarly resources. Happily, the two uses are not mutually exclusive although when conflicts do arise, the issue is almost invariably settled in favour of the sponsor body.

Most public (ie., government) archives are created to provide a repository for permanently valuable government records. Because such records furnish information and evidence of significant government activities and transactions, they can be searched, long after their immediate administrative value has passed, for precedents, for explanations and for substantiation of the government's position against the charges of various types of claimants.

In looking out for the interests of their sponsors, public archives also — sometimes quite inadvertently — build up a wealth of documentary information that is of interest to scholars.

In Canada, more so, perhaps, than in most countries, "public" archives have been encouraged to concern themselves not only with the public record, that is documentation generated by a popularly elected government, but also with the research needs of the public at large, that is, the populace. As a result, the provincial and territorial governments, following the example of the federal government's mandate to the Public Archives of Canada, have empowered their archives to collect any records, public or private, which bear upon the historical development of their respective jurisdictions. The N.W.T. Archives, by virtue of the Archives Act of 1981, has this broad responsibility.

In meeting the responsibility they have been handed, government archives face a problem not usually encountered by archives operating in other constituencies, namely the problem of the ancestry of their sponsor body. Unlike new businesses, which spring into being more or less spontaneously, new governments have, for centuries, had identifiable antecedents. Besides having a traceable line of descent, governments, like individuals, pass from a state of dependence to one of independence, where they take on a distinct and separate identity.

Whether the transition comes about through evolution or revolution, the implication is the same: the history of a nation or other geopolitical unit is not self-contained but part of a larger continuum. So too are the records which document that history.

Once they achieve a measure of independence, former colonial dependencies often establish archives of their own. Until such time as the records of the newly formed government become administratively "obsolete", however, there is little "home-grown" material to place in the new repository. This is especially true in cases where a society with a literate tradition has colonized one with an oral tradition and where, consequently, there are few if any indigenous documents which parallel or even predate those of the colonial administration.

In instances where the new political creation is a "blood-relative" of the one it replaced, an attempt is usually made to show continuity (and occasionally consanguinity). The historical breach that occurs when a new political entity is formed out of the empire of another is healed by stocking the archives of the new state with copies of pertinent records from the archives of the mother country (or countries). This was certainly the practice followed by the Public Archives of Canada (PAC). Founded in 1872, shortly after Confederation, the PAC sent teams of copyists to the central archives of Britain and France for the purpose of duplicating, for Canadian use, the records which had grown out of centuries of colonial rule.

The N.W.T. Archives today is in an analogous position. Because the N.W.T. was a colonial dependency, first of Great Britain, and then of Ottawa, most of the extant documents concerning its early history reside in repositories outside its borders. Even if the tendency of equating the N.W.T.'s past with European contact did not exist, the Archives would be no better off. The indigenous peoples were largely non-literate and left behind virtually no contemporary documentary records. What we are able to learn about these vibrant cultures must come through *ex post facto* documentation, such as oral history, and through the study of material remains.

In the tradition of other state archives in similar circumstances, then, the N.W.T. Archives is attempting to build up its own holdings of official (ie., governmental) records of the N.W.T.'s colonial past through what might be called "quasi replevin". This includes copying those federal government records which are concerned with the acquisition and subsequent administration of the N.W.T. from earliest times to the present. The process is expected to be aided immensely by the PAC's "Diffusion Programme" through which selected holdings of the PAC are distributed, in microform, to the archives of those provinces and territories to which the records relate.

This approach will ensure that the early years of white intrusion as well as the transition of the Territories from dependent to self-governing status are fully documented.

For the records of the increasingly autonomous Government of the Northwest Territories, however, a different method of acquisition is appropriate. The N.W.T. Archives, like most contemporary government archives worldwide, relies on the techniques of records management for collection development. Although responsibility for records management in the G.N.W.T. lies with the Department of Government Services rather than with the N.W.T. Archives, a Public Records Committee, of which the Territorial Archivist is *ex officio* chairman, exists to provide liaison between the two areas. It is the Committee's duty to ensure that the permanently valuable records of the Government of the N.W.T. from 1967 forward will, on being retired, make their way in an orderly and systematic fashion from the offices where they originated to the N.W.T. Archives.

While government departments are legally obliged to surrender to the N.W.T. Archives records which are 30 years old, few such records have yet arrived and been made available for public use. The records of many departments have, however, been scheduled for permanent retention or ultimate destruction and are currently being stored in the government's records centre. Systematic transfer to the Archives of those slated to be kept in perpetuity is expected to begin within the next couple of years.

The records raised by the Territorial Government are becoming increasingly important. The number of matters coming within the government's purview is steadily increasing as the federal government devolves upon the local government more and more responsibility for specific services. Furthermore, as the Territories grow in size and complexity, the range and quality of the services which must be provided within any one field will increase proportionately. As a result the associated records will be both more voluminous and more informative.

The Government of the Northwest Territories is assuming more and more of the powers it needs to shape its own destiny. Once all such powers have been vested in the local government, records associated with the exercise of them will be generated in the Territorial capital. When that occurs — and the realization is not too far distant — records on northern affairs will become indigenous to the north and the N.W.T. Archives will be a research centre of first resort.

Note

This paper was not presented at the NOIR/ACUNS meetings in Yellowknife. It is printed here to complement the Kobelka paper on the NWT Archives Library (ed).

THE GOVERNMENT LIBRARY OF THE NORTHWEST TERRITORIES WITH A NOTE ON THE RENEWABLE RESOURCES LIBRARY

Cynthia Ryan
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The Government Library is the central library of the Territorial Government (GNWT). It is administered by the department of Culture and Communication and is located on the first floor of the Laing Building in Yellowknife. It provides information to facilitate decision making and policy formation in the GNWT and government information in the public domain. The library's collection and services are primarily intended for the GNWT and the Legislative Assembly, however, the public is encouraged to make use of the library although there are some restrictions on services.

The Hon. David Crombie, former Minister of Indian and

Northern Affairs, has described Yellowknife as "two gold mines divided by three levels of government." The Government Library often feels like a series of pipeline reports proliferated by three levels of Government. We are however much more than that.

In the past the collection has emphasized the subject areas of public policy, public administration, political science and management, particularly as they relate to northern issues. It will continue to do so, however more emphasis will be given to building up what will hopefully be a strong collection in aboriginal rights and northern political development. In recognition of the existence of multiple official languages in the Northwest Territories, the library will also strive to collect, in aboriginal languages, all material available within the confines of its collection development policy. (These languages are Chipewyan, Cree, Dene, Dogrib, Inuktitut, North Slavey and South Slavey, ed.)

The Government Library is responsible for acquiring and offering access to GNWT reports and publications. It is the official repository of all GNWT publications in each language that they are offered. We have some GNWT reports dating back to 1970. These publications are available for circulation to government employees throughout the north and the public through interlibrary loans anywhere in Canada. Because of our depository status, we automatically receive copies of all publications produced by the GNWT printing bureau and we make an effort to try and pry out of each department a copy of all non-confidential reports produced by or for the Government.

Federal government publications are also received on deposit. Those which are useful to the collection are kept and the rest are distributed to other libraries depending upon their areas of specialization. For example, all legal materials are sent to the *Court Library*, health materials to the *Otto Schaefer Library*, historical materials to the *Archives Library*, building and construction materials to the *Public Works Library*, which also retains the community studies which were done for various town projects, and renewable resource materials to the *Renewable Resource Library*. All of these collections are in Yellowknife.

Government publications are a vast source of information and form a large part of our collection. Government information comes in different forms:

1) There are publications issuing from various departments. For example, the Canadian Transport Commission and the Department of Indian and Northern Affairs collaborated last year to produce a study entitled *Transportation Rates and Other Factors Affecting Northern Food Costs*. Another, from the Secretary of State, *Native Women: A Statistical Overview*, also done in 1985, attempts to give an overview of the differences that exist between native women and native men as well as differences with the non-native population, in the 1980's.

2) Statistics Canada publications and the GNWT Bureau of Statistics publications can be used separately or in conjunction to collect northern data of interest to northerners, consultants, governments dealing in the North, and companies proposing to do business in the North. For example Statistics Canada publishes our "isolated post indexes" which express, at a given point in time, the relationship between prices for a specific range of goods and services at a northern community and those in a selected Canadian city.

3) We have census information from 1961 onward. Information from the 1986 census will be released from April/87 to April/89. The 1981 census was the first modern Canadian census to seek the identification of all native peoples. As a result it is not possible at this time, to show trends and changes over time, however the 1986 census will follow up on the 1981 data. The library has the information on native people collected from the 1981 census on microfiche. It contains particularly interesting northern community data not found elsewhere.

4) A repository of major speeches made by GNWT ministers or deputy ministers where appropriate has just been started in the library. It is intended to provide assistance to those researching or writing speeches and presentations for members of the executive council. It is intended that the availability of past statements made and positions taken on behalf of the GNWT will assist in presenting a consistent public position on issues. Like any other library materials these speeches are available to the public.

5) *Northern Decisions* is a biweekly looseleaf service published by the Canadian Arctic Resources Committee which announces "regulatory and policy decisions on natural resources management north of 60".

If you are looking for northern information from sources other than from government material we also have the following items:

1) Publications of various organizations. These can be in the form of technical report literature from industry, consulting firms, and universities or papers from conferences, meetings, and workshops. For example, the *Sourcebook for Native Participation in Canadian Mineral Activities* put out by the Centre for Resource Studies is a study aimed at native people who wish to become involved in employment or entrepreneurial activities related to the mineral industry.

2) Newspapers and news announcements. We subscribe to and circulate most of the major northern newspapers. These can be indexed manually or on-line by using the Boreal Institute's *Northern Titles* index. We also keep CBC news summaries and news announcements from the GNWT, Western Constitutional Forum, and Nunavut Constitutional Forum.

If you feel your research would be enhanced by a knowledge of developments in other northern countries with similar problems, we have two items which may be of interest. The first is *Press Extracts on Greenland* which is compiled by the Department of Indian and Northern Affairs. The items it contains are remarkably similar in content and style to those found in *News/North*. The second, *Extracts from the Soviet Press on the Soviet North and the Antarctic*, is compiled by the Department of External Affairs in Ottawa. Either the translators at External Affairs have quite a sense of humour or the Soviet Press is a lot more amusing than we've been led to believe. In a recent issue there was an article on a polar bears' picnic and an item dealing with the problems with commercial airplane schedules and the food on board — a familiar problem anywhere in the north. In this story the plane was 24 hours behind schedule because the aircraft services food truck was late in bringing lemonade on board. The passengers were quite incensed and the article ends by suggesting that perhaps it is time to start punishing irresponsibility in a concrete way.

3) Periodicals and periodical indexes. Although most of our collection of periodicals is more general in nature, some relate directly to the North and northern issues. The periodicals can be assessed manually, for example we have an index of the *Beaver* magazine from 1920 onward, or on-line through a variety of data bases.

4) Bibliographies. We receive bibliographies from a variety of sources. They are a problem in that they need updating as soon as they are printed, however, as some are unique, we retain them in spite of their age. We also receive items such as the *ASTIS Current Awareness Bulletin*, from the Arctic Institute of North America, and *Recent Polar and Glaciological Literature* from the Scott Polar Research Institute, England.

The library publishes a quarterly bulletin, *Government Library News* which deals with the library's programs, functions, and services. It also contains listings of newly acquired books. The Library also publishes the *List of Serials Held by the Government Library*, which is a list of available journals and newspapers.

I would also like to mention the N.W.T. Newspaper Preservation Committee. It is part of a voluntary, cooperative, Canada-wide program co-ordinated by the National Library to collect, preserve, and provide access to Canadian newspapers. In the South, newspapers are considered a valuable source of Canadiana. In the North, much information has gone unrecorded because of the oral tradition and newspapers are therefore an invaluable source of information. In many cases, they may be the only written history of a particular place, its people, and events.

Because newspapers are printed on fragile material, they deteriorate quickly. Unless a systematic program of preservation is initiated, this valuable source of historical material will soon be lost — indeed, much may already be lost. Because this project can only succeed with grassroots support, we are asking for your help.

1) Are you aware of any N.W.T. newspaper titles which are not on the accompanying list (Table I)?

2) Have you copies of any N.W.T. newspapers which you would be willing to give or lend to us for microfilming? The microfilm copies would be stored in the Territorial Archives and available to everyone.

3) If you have copies of some of these titles, would you mind advising us which issues you hold?

Thank you in advance, for any help you can give to us. If you have information for us or would like more information on the project, please contact either the author or David Rudkin, c/o Territorial Archives, P.O. Box 1320, Yellowknife, N.W.T., X1A 2L9 (403) 873-7657.

A NOTE ON THE RENEWABLE RESOURCES LIBRARY

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The Renewable Resources Library houses approximately 7500 items dealing mainly with northern wildlife and environmental concerns over which the Territorial Government has jurisdiction. This library was established to service the Department of Renewable Resources, NWT, but any one else is welcome to use the resources in person or through interlibrary loan procedures. The library contains many unpublished reports, and subscribes to approximately 75 wildlife and northern periodicals.

The Renewable Resources Library will be moving in the summer of 1986 from its present cramped quarters in the Court House Building to an area of approximately 600 sq. ft., triple its present size, in the Scotia Centre Building, Yellowknife, N.W.T.

TABLE I
LIST OF NEWSPAPERS THAT ORIGINATE WITHIN THE N.W.T. (July, 1986)

Adjurnarmat — Eskimo Point
Akana — Inuvik
The Aklavik Journal — Aklavik
L'Aquilon — Yellowknife
Arctic Bay News — Arctic Bay

Arctic Echoes — ?
Arctic Howel — Baker Lake
The Arctic News — Yellowknife
Arjungnagimmit — Eskimo Point
Arviap Nipinga — Eskimo Point
Arviap Nipingit — Eskimo Point
Atta — Inuvik
Aurora — Yellowknife
Ayurnarmat — Eskimo Point
Baffin News — Frobisher Bay
Baker Lake — Baker Lake
Banks Land Letter — Sachs Harbour
The Bankslander/Sachs Echo — Sachs Harbour
The Beaufort Seer — ?
Brotherhood Report — Yellowknife
Building Blocks — Yellowknife
Cambridge Echo — Cambridge Bay
Canada North of 60 — ?
Cape Dorset News — Cape Dorset
Centennial Newsletter — Yellowknife
Central Arctic News — Cambridge Bay
Coastline Canada — Tuktoyaktuk
Cold Inferno — Yellowknife
Confluence — Fort Smith
Co-op North — Yellowknife
COPE Newsletter — Inuvik
Clyde River — Clyde River
Dene — Yellowknife
Dene Express — Fort Good Hope
Dene Nation Newsletter — Yellowknife
Dene, Northwest Territories, Indian Brotherhood, Native Bulletin — Yellowknife
Dialogue North — Yellowknife
The Drum — Inuvik
Eastern Arctic Newsweek — Frobisher Bay
Eastern Arctic Star — Frobisher Bay
Education Focus — Yellowknife
The Forgotten People — ?
Fort Simpson Journal — Fort Simpson
Fort Smith Journal — Fort Smith
Fort Smith News — Fort Smith
Goinsiday: Telling the News — Yellowknife
Goondee Cho — Fort Providence
The Great White North Newsletter — Rankin Inlet
Hare Express — Fort Good Hope
Hay River News — Hay River
Honeybucket — Yellowknife
The Hub — Hay River
The Igloolik Irregular — Igloolik
Igloolik Weekly Newsletter — Igloolik
Imianik — Cambridge Bay
The Indian News — ?
The Interpreter — Yellowknife
Innummarit — Igloolik
Inuit Cultural Institute News — Eskimo Point
Inuit Cultural Institute Newsletter — Eskimo Point
Inuit Nipingat — Baker Lake
Inuit Nipingit/Keewatin Echo — Baker Lake
Inuit Okaoheet — Cambridge Bay
Inuit Ublumi/Inuit Today — Frobisher Bay
Inukshuk — Frobisher Bay
Inungnut — Rankin Inlet
Inuni-Inunu — Rankin Inlet
Inuvialuit — Inuvik
The Inuvik Drum — Inuvik
Issumarit — Rankin Inlet
Issumavik — Keewatin
Kamanituak Klarion — Baker Lake
Katajjaq — Frobisher Bay
Keewatin Breeze — Rankin Inlet
Keewatin Echo — Eskimo Point
Keewatin Inuit Association News — Rankin Inlet
Keewatin Journal — Rankin Inlet
Keewatin Newsletter — Rankin Inlet
Kisaut — Chesterfield Inlet
Kissiliviyeet — Yellowknife
Kisso — Yellowknife
Kitikmeot News — Cambridge Bay
Koglotomuit News — Coppermine
Lake Harbour Speaks — Lake Harbour
L'Aquilon — Yellowknife
Learning — Yellowknife
Local News — Pond Inlet
The Local Rag — Baker Lake
The Listening Post — Frobisher Bay
Mackenzie Drift — Inuvik
Mackenzie News — Fort Simpson
Mackenzie Pilot — Fort Smith
Mackenzie Pilot — Hay River
Messenger/Tusautit — Eskimo Point
Metis Newsletter — Yellowknife
The Midnight Sun — Igloolik
Muskrat — Aklavik
Nakasuk Newspaper — Frobisher Bay
NAP (News About People) — Yellowknife
Native Press — Yellowknife
Native Women's News — Yellowknife
News/North — Yellowknife
News of the North — Yellowknife
Newsletter — Eskimo Point
News Raedzo — Rae Edzo
Newsweek of Pond Inlet — Pond Inlet
New Views — Pangnirtung
Nipisailak — Igloolik
Norpinioin — Yellowknife
The North Star — Yellowknife
The Norther — Fort Smith
Northern Breed — Yellowknife
Northern Lights — Yellowknife
Northern News Report — Yellowknife
Northern Women's Magazine — Yellowknife
Northwest Observer — Fort Simpson
Nuna — Cambridge Bay
Nunatsiaq News — Frobisher Bay
Nunavut Onipkaat — Cambridge Bay
Okausit — ?
Okpik Tikitpuk — Cambridge Bay
Our Family/Ilavut — Yellowknife
Pangnirtung — Pangnirtung
Pangnirtung News and Views — Pangnirtung
Peel River Press — Fort McPherson
Photo News — Fort Smith
The Pilot — Fort Smith
The Pilot — Hay River
The Pilot, in the Heart of Muffaloose Country — Fort Smith
Pine Pointer — Pine Point
Polaris Vision — Yellowknife

Pond Inlet News — Pond Inlet
The Prospector — Yellowknife
Rankin Inlet Newsletter — Rankin Inlet
Rankin Times — Rankin Inlet
Settlement Office Newsletter — Cambridge Bay
Slave River Journal — Fort Smith
Snowdrift News — Snowdrift
Spousal Assault Networker — Yellowknife
St. George's Uniutiuut — Cambridge Bay
Suvaga — Pond Inlet
Suvaquq — Pond Inlet
Suvaguuq — Rankin Inlet
Takusee — Chesterfield Inlet
Tapwe — Fort Smith
Tapwe — Hay River
Tetlit Tribune — Fort MacPherson
Think News — Frobisher Bay
Tree of Peace Newsletter — Yellowknife
Tsigionda (The Talking Tree) — Yellowknife
Tukisivaksat — Yellowknife
Tulita — Fort Norman
Tumik — Resolute
Tusagaksat — Baker Lake
Tusagaksat — Frobisher Lake
Tusaquik — Frobisher Bay
Tisaquik/Listening Post — Frobisher Bay
Tusarasapik Nutat — Pangnirtung
Tusarasapikt Nutat — Pangnirtung
Tusautit — Eskimo Point
Tussayavut — Tuktoyaktuk
Tuttutiut — Povungnituk
The Ulu — Holman Island
The Ulu News — (varies with the Arctic Winter Games)
We Understand — Pond Inlet
Whale Cove Country News — Whale Cove
Wrigley Drumbeats — Wrigley
The Yellowknife Blade — Yellowknife
Yellowknifer — Yellowknife

OCCUPATIONAL HEALTH AND SAFETY INFORMATION SERVICE — RESOURCE CENTRE SAFETY DIVISION DEPARTMENT OF JUSTICE GOVERNMENT OF THE N.W.T.

Laurie Nowakowski

Head, Occupational Health and Safety, Safety Division, Department of Justice, Government of the N.W.T.
Yellowknife, N.W.T. X1A 2L9, (403) 873-7470 or Zenith 06120

The Occupational Health and Safety Section of the Safety Division has a primary role in education and consulting services in the field of worker health and safety in the N.W.T. Where there is a particular type of work there are certain risks, health hazards, and corresponding measures to protect the worker. In the field of "northern and offshore resources" there are particular work processes in the petroleum industry which present unique workplace hazards or concerns regarding working conditions, the working environment, and safe methods used to complete a task. It is with this general thought in mind that I wish to introduce an information area which the reader may or may not have considered as a source for research or even as a subject area requiring particular attention.

One of the most important tasks of our office is to provide up-to-date information to workers, employers, government agencies, native organizations, unions, worker representatives, health care personnel, and even the public, on any subject which may affect the health or safety of people at a work site. It is based on this information that decisions are made and concerns are addressed which affect the lives of workers every day. But as anyone knows, having information and access to resources in any subject area and not having that information adequately utilized is worse than having no information at all.

So what is my hook, so that you will come to be as excited as those of us who work with occupational health and safety information and in particular with reference to the field of northern and offshore resources? Let me list a number of very interesting pieces of information which may be related to your areas of interest: specific to the petroleum industry including offshore activities.

1. "Perpetual motion of the sea in many regions creates a background noise of up to 80 dB(A)."[1]

2. "A significant proportion of fatal accidents that occur in the petroleum industry are associated with road, sea, or air transport of personnel or goods."[2]

3. "The number of accident victims is still too high, and serious accidents often occur among the workers employed in certain sections of the petroleum industry. Among the branches of activity with the highest accident rates are exploration and drilling, particularly offshore. A

high percentage of accidents occur from apparently minor causes such as falling and slipping, striking against objects or errors in handling and carrying heavy loads. This is evidence of a certain lack of concern about aspects which are mostly bound up with the human factor and which often reflect a lack of training and instruction in correct and/or safe working methods."[3]

4. "Skin diseases head the list of occupational diseases leading to the largest number of lost workdays."[4]

5. Shift work — "prolonged periods of shift work increases the relative risk of contracting a chronic stress -related disease [ischemic heart disease] IHD.
— Short term results may be as simple as sleep disturbances, gastro intestinal disease, such as peptic ulcers."
— "Only ten years after shift work was the excess risk statistically significant. After 20 years of shift work the relative risk dropped to no access risk, possibly because the shift work group after such long exposures was a natural selection of healthy workers."[5]

Now you may ask, where did these interesting pieces of information come from? The Occupational Health and Safety Resource Centre has a collection of materials which cover a wide variety of health and safety topics and is available for use by government, industry, unions, and the general public. The collection includes books, reports, periodicals, data sheets, standards, pamphlets, posters, films, video cassettes and slides.

The computer link with the Canadian Centre for Occupational Health and Safety provides access to current information from world-wide sources. It is the computer link which is the highlight of our resource centre. A computer terminal with access to international information on occupational health and safety was originally installed in Yellowknife in 1980 as a pilot project of the Canadian Centre for Occupational Health and Safety. The Canadian Centre for Occupational Health and Safety (CCOHS) is a federal crown corporation established in 1978 to promote the right of Canadians to a healthy and safe working environment. We were chosen as the spot for the data base link because of our isolation as it was felt that if the communication link held up between Yellowknife and the main Ontario data base, there would be no problems with link-ups between other Canadian centres.

The CCOHS has signed contracts with two important organizations — the International Labour Organization and the United States National Institute for Occupational Safety and Health, in order to provide access in Canada to the data bases of these organizations. In addition, the CCOHS has developed a number of its own data bases.

The Occupational Health and Safety Section of Justice, in the N.W.T., has signed a contract to provide the public with access to these data bases.

What is available?

The computerized information service provides information on workplace hazards and ways to deal with them. For example, the service can help in determining methods and procedures available for carrying out a job safely. It can help in determining whether a substance is dangerous to health or safety and also what laws and regulations apply to individual workplaces.

Information is available in both French and English.

CIS abstracts (International Safety and Health Information Centre)

CCOHS is tied in with the International Safety and Health Information Centre (CIS) data bank in Geneva, Switzerland, a service of the ILO.

CIS abstracts are an international source of bibliographic information covering all aspects of occupational health and safety. Currently, the data base has about 40,000 references from a wide range of periodicals, books, reports, conference proceedings, and relevant legislation.

NIOSHTIC (National Institute for Occupational Safety and Health Technical Information Centre)

CCOHS also provides access to the NIOSHTIC data base of the United States National Institute for Occupational Safety and Health. NIOSHTIC contains bibliographic material from a wide variety of disciplines related to occupational health and safety. NIOSHTIC allows the retrieval of complete bibliographic citations and abstracts of books, journal articles, and all NIOSH publications, including contract and grant reports. The source literature derives from the U.S. and other countries. Currently, NIOSHTIC contains about 100,000 references.

CIOL (Canadian Centre for Occupational Health and Safety)

The Chemical Information Online data base (CIOL) is a chemical information system that will continue to develop over time. Currently, it has two main components.

TN (Trade Name) file

TN provides manufacturers' information on potential hazards of working with a particular product and necessary precautions. Emphasis is placed on products of Canadian origin and/or usage. This information is derived from material data sheets obtained directly from the manufacturers. The coverage includes product information such as ingredients, toxicity, personal protection, clean-up and disposal, storage and handling, first aid procedures, chemical and physical properties, and fire extinguishing media.

Cheminfo file

Cheminfo file, which is complementary to the TN component, lists the chemical and physical properties of each individual ingredient of the products included in the TN file. Cheminfo also contains information on toxicity, personal protection, first aid procedures, and storage and handling.

INFODOC (Canadian Centre for Occupational Health and Safety)

INFODOC is a bibliographic data base providing access to CCOHS's documentary information. INFODOC is particularly strong in its coverage of Canadian occupational health and safety materials.

Our occupational health & safety resource centre offers access to these data bases through our offices or individuals may wish to deal directly with the CCOHS inquiry service in Hamilton, Ontario. The advantage of dealing with CCOHS directly is that they can offer the specific advisory services with specialists appropriate to the technical needs of an inquiry such as:

- medical advisory service (Occupational diseases, psychosocial hazards, medical monitoring, audiometry)
- safety services (accident prevention, ergonomics, safety programs, safety committees, shift work)
- material hazards (chemicals, industrial hygiene, physical properties of materials)
- Physical hazards (light, temperature, pressure, radiation, noise)
- statistics (descriptive statistics, collection of data, statistical sources)
- law (statutes and regulations, official guidelines).

As we could provide "pieces to a puzzle", the CCOHS may complete your inquiry as a full compiled report. The advantage of dealing with our office is that we are northern-based and have had more frequent access to the various subjects relative to the needs of the northern setting. Just as a point of interest, our office, although very small in numbers of staff, has dealt with many inquiries from individuals in the N.W.T. Requests for information numbered 100 in 1981 up to 1400 in 1985. We feel that this is just the beginning.

Who may use the service?

Enquiries covering work related problems are invited from:

- occupational health and safety committees
- labour representatives
- all employers
- all workers
- members of the general public
- other N.W.T. government departments
- native organizations.

How much does the service cost?

There is no charge for the service.

How to obtain information?

Enquiries may be made by phone, mail, or in person to: Occupational Health and Safety Resource Centre at the address given at the beginning of this article.

Sources

[1,2,3,4] Quoted from "Working conditions and Working Environment in the Petroleum Industry Including Offshore Activities" International Labor Organization (Geneva), Report III, Petroleum Committee, Ninth Session, 1980, pg. 7-30.

[5] National Institute for Psychosocial Factors and Health, Cardiovascular Disease — Factors of Importance in Shift Workers, author Orth-Gomer, Kristima, M.D. Arbete och halsa, (Solna, Sweden) n. 28, 1985, pg. 56-63.

N.W.T. PUBLIC LIBRARY SERVICES WITH A LISTING OF MEMBER LIBRARIES AND OF NEWSPAPER HOLDINGS

Marion L. Pape
Chief, NWT Public Library Services
P.O. Box 1100, Hay River, NWT X0E 0R0, (403) 874-6531 or Telex 034-4311

Northwest Territories Public Library Services is a Division within the Department of Culture and Communications with a mandate to provide library services to the public of the NWT.

It was decided to locate Headquarters for this service in Hay River, a decision which was made prior to the naming of Yellowknife as the capital of the Territory. Collections have been developing since 1966 when the system was established. We currently have 19 member libraries with three new community libraries coming on stream this year (see list). There has been a great deal of pressure to expand library services to smaller communities but the ability of Headquarters to provide the necessary support services is limited. Rotating deposit collections are available to communities on request and individual borrowers from anywhere in the NWT have a Borrower-by-Mail service available to them.

A union catalog of holdings is located in Hay River but this information is not yet available to community libraries. The City of Yellowknife has an automated record of their holdings using the Apple IIE computer but this does not include system holdings. There is an active effort at present to automate our system holdings in order to make information available either on-line or by microfiche to community libraries.

Although much of the collection in community libraries is traditional print materials covering a broad interest area, there is a great deal of popular interest in materials about the north and in materials in the Aboriginal languages of the NWT. Library Services has a priority to develop multimedia collections in these areas and accesses materials in multiple copies so as to be able to locate these in select community libraries. Keeping in mind that people in the communities have a quite different manner of accessing information, the audio-visual and oral format has a higher appeal than print format.

With reference to Northern Resources, since the Library System was formed 20 years ago, we have been developing a monograph collection on a variety of northern topics including northern history, literature, geography, and science. This collection of over 500 titles is fully catalogued and the majority of it is housed in the Yellowknife Public Library. An inventory of this valuable collection is in progress and we hope to produce a bibliography as soon as resources permit. As an integral part of our selection policy, we are continuing to develop collections in this area. We are also expanding our Northern collections in regional libraries as well as in communities like Pangnirtung which have a strong tourism interest. In addition, every community library has a set of basic stock items which include a core collection of northern materials produced in the north or of high relevance to northern people. Example of this type of collection would be *Harvesting the Northern Wild* by Marilyn Walker, *Paper Stays Put* by Robin Gedalof, or *An Arctic Man* by Ernie Lyall. Northern basic stock collections in each community library number approximately 150 titles.

Headquarters has a collection of vertical file materials on Northern topics organized into 140 different subject areas such as caves, Arctic climate, Inuit games, land claims, sled dog racing, arts and crafts, and communities in the NWT. These files are mainly historical in nature. They are a combination of articles, pamphlets and reports. They are a good source for some local history but not for up-to-date information. We also have the microfiche from the Canadian Curriculum in support of native peoples, 1973-78. Copies of scientific and historical reports and other vertical file material from the Institute of Northern Studies, University of Saskatchewan were donated to the John Ayaruaq Community Library in Rankin Inlet. Included are papers on a wide variety of topics including insects, northern animals, plants, anthropology, geology, geography and education. A list of these documents is in preparation and will be included in the Northern bibliography. Also donated was a collection of general books on anthropology, sociology, and historical materials on the North. The Aboriginal languages and cultures are taking on greater prominence in libraries in the NWT as communities start recognizing the need to make these materials available. In a recently published Report of the Task Force on Aboriginal Languages libraries emphasized that more material, oral, audio-visual, and written, should be deposited in their libraries. There has been a serious problem accessing this material as individual groups distribute the material to limited audiences. Hopefully, this will change as libraries develop a higher profile and as more material becomes available.

As a special project in the summer of 1985, the John Ayaruaq Library duplicated a collection of audio tapes from CBC, Rankin Inlet. Information on Northern poetry, music, legends and stories, personal histories, and oral histories are included. For example, Zachary Ittimanqaq, of the Netsilik Series and Never Cry Wolf is featured. In addition, there are interviews with well-known elders from the Keewatin communities, Pelly Bay, Spence Bay and Igloolik. These tapes are being catalogued and are available for loan.

Library Services actively collects print material in Aboriginal Languages published independently or through the Program Division of the Department of Education. There are also English Language story materials about Northern experiences which have been published primarily for use in schools. An extensive collection of Kativik School Board materials are being accessed in multiple copies and made available in the community libraries.

In addition, we are collecting Dene Language video tapes that have been produced by the Audio-Visual Division of the Department of Culture and Communications. These include information about a variety of government programs and services as well as programs about Dene communities. In a similar fashion we intend to start collecting audio and video tapes produced by organizations such as the Inuvialuit Communications Society, Inuit Broadcasting Corporation, Native Communications Society and Canadian Broadcasting Corporation wherever possible. A revised collection development policy is being prepared to incorporate these changes in priority.

A list of northern newspapers contained in the Public Library System is attached. The list includes all the newspaper holdings of NWT Public Library Services that are shelved in Headquarters. This is a valuable historical record of life in the communities and does not circulate although patrons may use them in the library. Local libraries in the communities also have subscriptions to northern newspapers and all libraries subscribe to *Up Here* magazine published by Outcrop.

Library Services is a full depository for NWT Government documents and all documents tabled at the Legislative Assembly. Some of the more significant documents of large scale popular interest are being isolated for full cataloguing and distributed to each of our community libraries along with translations, if available. Some examples include *The Report of the Task Force on Aboriginal Languages*, *Report on the Task Force on Spousal Assault*, the *5 Year Action Plan for Women*, and Constitutional Development documents. In addition, Library Services plans to establish Government Information Centres for free public distribution in each community library over the next year in cooperation with the Printing Division of the Department of Culture and Communications. This material often constitutes the most current information source on northern issues.

Accessibility to all the various collections of NWT Public Library Services show our major weakness. Information technology is not yet in common use in libraries, affecting our ability to produce a union catalog of holdings so that others know what we have available. A giant leap is required so that we can more successfully share resources between libraries. We are dedicated to this pursuit over the next short period of time and there appears to be support for our goal.

MEMBER LIBRARIES

NWT PUBLIC LIBRARY SERVICES
BOX 1100
HAY RIVER, NWT X0E 0R0

AKLAVIK COMMUNITY LIBRARY
Aklavik, NWT
X0E 0A0

CAMBRIDGE BAY CENTENNIAL LIBRARY
Cambridge Bay, NWT
X0E 0C0

CAPE DORSET COMMUNITY LIBRARY
Cape Dorset, NWT
X0A 0C0

COPPERMINE COMMUNITY LIBRARY
Adult Education Centre
Coppermine, NWT X0E 0E0

FORT NORMAN COMMUNITY LIBRARY
Fort Norman, NWT
X0E 0K0

FORT SIMPSON PUBLIC LIBRARY
Box 258
Fort Simpson, NWT X0E 0N0

MARY KAESER LIBRARY
Box 630
Fort Smith, NWT X0E 0P0

FROBISHER BAY CENTENNIAL LIBRARY
Bag 189A
Frobisher Bay, NWT X0A 0H0

NWT CENTENNIAL LIBRARY
Box 1100
Hay River, NWT X0E 0R0

IGLOOLIK COMMUNITY LIBRARY
Igloolik, NWT
X0A 0L0

INUVIK CENTENNIAL LIBRARY
Box 1640
Inuvik, NWT X0E 0T0

NANISIVIK COMMUNITY LIBRARY
Box 115, Nanisivik
Strathcona Sound, NWT X0A 0X0

NORMAN WELLS COMMUNITY LIBRARY
Box 97
Norman Wells, NWT X0E 0V0

PANGNIRTUNG COMMUNITY LIBRARY
Pangnirtung, NWT
X0A 0R0

PINE POINT COMMUNITY LIBRARY
Box 177
Pine Point, NWT X0E 0W0

JOHN AYARUAQ LIBRARY
Rankin Inlet, NWT
X0C 0G0

SPENCE BAY COMMUNITY LIBRARY
Netsilik School
Spence Bay, NWT X0E 1B0

TUKTOYAKTUK COMMUNITY LIBRARY
Tuktoyaktuk, NWT
X0C 1C0

YELLOWKNIFE PUBLIC LIBRARY
Box 694
Yellowknife, NWT X1A 2N5

TO BE ADDED 1986:

RAE EDZO COMMUNITY LIBRARY
Rae Edzo, NWT X0E 0Y0

BAKER LAKE COMMUNITY LIBRARY
Baker Lake, NWT X0A 0A0

CLYDE RIVER COMMUNITY LIBRARY
Clyde River, NWT X0A 0E0

LIST OF NORTHERN NEWSPAPER HOLDINGS

ARVIAP NIPINGA
Eskimo Point, NWT
—English/Inuktitut
—irregular
—1971 - 1976

AURORA
Cascade Building
Ft. Smith, NWT
—irregular
—English
—April 1984 -

CAPE DORSET NEWS
Cape Dorset, NWT
—English/Inuktitut
—irregular
—1974

CARIBOU
Nortext Information Design Ltd
—English/Inuktitut
—bimonthly
—1981 -

CONFLUENCE
Ft. Simpson, NWT
—English
—regular
—1977

DENE NATION NEWSLETTER
Lanny Cooke Produced
—English
—irregular
—Dec. 1984 - Jan. 1985

EASTERN ARCTIC STAR
Frobisher Bay, NWT
—English
—regular
—1970 - 1972

ESSO NORTH
Esso Resources Ltd.
—English
—quarterly
—1982 - 1985

FORT SIMPSON JOURNAL
Ft. Simpson, NWT
—English
—irregular
—1976 - 1978

FORT SMITH NEWS
Canarctic Graphics
—English
—weekly
—1978 - 1979

GOINSIDAY
Dept. of Information — GNWT
—English
—monthly
—1973 - 1975

HARE EXPRESS
Fort Good Hope, NWT
—English
—irregular
—1972 - 1973

HAY RIVER NEWS
Hay River, NWT
—English
—monthly
—1967 - 1972

HUB (THE)
Hub Publications
—English
—weekly
—1973 -

IGALAAQ
Nortext
—English/Inuktitut
—monthly
—1979 - 1983

IMIANIK (CAMBRIDGE ECHO)
Cambridge Bay, NWT
—English/Inuktitut
—irregular
—1971 and 1972

INDIAN NEWS
Indian & Northern Affairs
—English/French
—monthly
—1967; 1969-1971-1975; 1978-1982

INTERPRETER (THE)
Dept. of Information — GNWT
—English/Inuktitut
—monthly
—1975 - 1978

INUKSHUK
Frobisher Bay, NWT
—English/Inuktitut
—weekly
—1973 - 1976

INUVIALUIT
Inuvialuit Communications Society
—English/Inuktitut
—monthly
—1983 - 1984

INUVIK DRUM
Daniel Holman — Publisher
—English
—weekly
—1966 -

KAINAI NEWS
Indian News Media Society
—English
—bimonthly
—1979 -

KAMANITUAK KLARION
Baker Lake, NWT
—English/Inuktitut
—irregular
—1972 + 1973

KEEWATIN ECHO
Eskimo Point, NWT
—English/Inuktitut
—irregular
—1968 - 1974

KINATUINAMOT ILEGAJUK
Labrador Inuit Association
—English
—irregular
—1980 -

LISTENING POST (THE)
DIAND — Frobisher Bay, NWT
—English/Inuktitut
—irregular
—1968 - 1971

MACKENZIE DRIFT
Marius Dakin & Rose Boniface
—English
—weekly
—1979 - 1980

MACKENZIE NEWS
Ft. Simpson, NWT
—English
—irregular
—1972 - 1976

MESSENGER
Eskimo Point, NWT
—English/Inuktitut
—irregular
—1968 + 1970

METIS NEWSLETTER
Metis Association of NWT
—English
—monthly
—1980 - 1983

MIDNIGHT SUN
Igloolik, NWT
—English/Inuktitut
—irregular
—1969 - 1974

NATIVE PEOPLE
Alberta Native Communications Society
—English/Inuktitut
—weekly
—1974 - 1976 + 1978 Microfilm
—1973 - 1982 on paper

NATIVE PRESS
Native Communication Society
—English
—weekly
—1971 -

NEWS AND VIEWS
Pangnirtung Settlement Council
—English/Inuktitut
—irregular
—1972 (dup. copies)

NEWS NORTH (NEWS OF THE NORTH)
Northern News Service
—English
—weekly
—1945 - 1984 Microfilm
1947 - 1979 on paper
1984 - on paper

NEWSWEEK
Pond Inlet, NWT
—English/Inuktitut
—irregular
—1972 - 1973

NORTHER (THE)
Hay River News Ltd.
—English
—weekly
—1966 - 1971

NORTHERN NEWS
Northern News Service
—English
—weekly
—1976 - 1978

NORTALK
Dept. of Information — GNWT
—English
—irregular
—1977 - 1978

NORTHERN MINER
Northern Miner Press Ltd.
—English
—weekly
—1974 - 1975; 1977 -

NUNATSIAQ NEWS
Frobisher Bay, NWT
—English/Inuktitut
—weekly
—1976 - 1982; 1984 -

OKRUK
Petroleum Industry Community on
the Employment of Northern
Residents
—English
—bimonthly
—1970 - 1976
Note: Ceased 1976

OUR FAMILY
Frobisher Bay, NWT
—English/Inuktitut
—irregular
—1977 - 1983

PEEL RIVER PRESS
Ft. McPherson, NWT
—English
—irregular
—1970 + 1971

PHOTO NEWS
Ft. Smith, NWT — A.V.T.C.
—English
—irregular
—1979 - 1982

PILOT ([illegible]E)
Ft. Smith, NWT
—English
—regular
—1973 - 1977

PINE POINTER
Pine Point, NWT
—English
—biweekly
—1976 -

POLAR STAR
University of Alaska
—English
—irregular
—1980

PROSPECTOR (THE)
Yellowknife, NWT
—English
—irregular
—1938 - 1939

RANKIN INLET NEWSLETTER
Rankin Inlet, NWT
—English/Inuktitut
—irregular
—1972 - 1973

RANKIN TIMES
Rankin Inlet, NWT
—English/Inuktitut
—irregular
—1976

SLAVE RIVER JOURNAL
Ft. Smith, NWT
—English
—weekly
—1979

SUVAGAQ
Pond Inlet, NWT
—English/Inuktitut
—irregular
—1974 - 1976

TAIGA TIMES
Baytides Publishers
—English
—weekly
—1969; 1971 - 1974

TAPWE
Boreal Press Ltd.
—English
—weekly
—1963 - 1981

T'SIGONDE
Tree of Peace
Yellowknife, NWT
—English
—monthly
—1974; 1982

TULITA
Ft. Norman, NWT
—English
—irregular
—no date and/or volume given

TUMIK
Resolute Bay, NWT
—English/Inuktitut
—irregular
—1975 - 1976

TUNDRA TIMES
Indian, Eskimo & Aleut Publishing
—English
—monthly
—1968 - 1981

TUSARASAPIT NUTAT
Pangnirtung, NWT
—English/Inuktitut
—irregular
—Feb. 1973 - Jan. 1974
(stampdated)

TUSAUTIT NEWSLETTER
—English/Inuktitut
—irregular
—May 1985
—No publisher given
Pangnirtung, NWT

ULU NEWS
1984 Arctic Winter Games
—English
—weekly
—1970; 1972; 1974; 1978; 1984

WHITEHORSE STAR
Whitehorse, Yukon
—English
—triweekly
—1974

WRIGLEY DRUMBEATS
Ft. Wrigley, NWT
—English
—irregular
—1972

YELLOWKNIFER
Northern News Service
—English
—weekly
—1972 - 1981 Microfilm
1972 - on paper

INDIAN AND NORTHERN AFFAIRS CANADA TECHNICAL LIBRARY, YELLOWKNIFE, N.W.T.

Donald A. Albright
Regional Librarian, Indian & Northern Affairs Canada
Box 1500, Yellowknife, N.W.T. X1A 2R3 (403) 920-8144

The technical library of Indian and Northern Affairs Canada in Yellowknife is more than a service to departmental employees. However, it was started as such a service in 1973 with mainly a geology collection. As the library grew it expanded to include other topics, such as land claims, native rights, management problems, writing skills and computers. As the library progressed it became apparent that other government agencies, local industry and members of the general public required access to information in the earth sciences. So the library has opened up and grown to the point where anyone who lives in the Territories or who is visiting the N.W.T. for the purpose of carrying out scientific research is welcome to the library facilities. Thus the library presently has an open use policy. Interlibrary loan requests are also welcome from other libraries and institutions.

The following Arctic or northern materials are included in our collection:

1. Geological theses for the various regions of the Northwest Territories.
2. Consultant, industry and government reports on pipelines, such as, Mackenzie Valley Pipeline, Arctic Islands Pipeline Project, Pointed Mountain Natural Gas Pipeline, Polar Gas Pipeline and Alaska pipelines.
3. Similar types of reports on mines, such as, Camlaren, Cullaton Lake, Gaint, Con, Nanisivik and Baffin Iron.
4. Petroleum reports are available for aspects like oil spills and oil wells in such areas as the Beaufort Sea, Davis Strait, Lancaster Sound and the High Arctic.
5. Hydro-electric projects, proposals and surveys involving the north, especially in areas such as Slave River, Liard River, Churchill Falls, Great Bear River, Taltson River, Thelon River, Kakisa River and Elsie Falls.
6. Northern newspapers include the following: "Inuvik Drum", "Native Press", "News/North", "Yellowknifer", "Slave River Journal", "Nunatsiaq News", "Northern Miner" and "Caribou".

7. The following are the Arctic and related interests journals available from the library: "Agroborealis", "Alaska Magazine", "Alaska Co-operative Wildlife Research Unit Progress Notes", "Alaska Geographic", "Alaska OSCEAP Newsletter", "Arctic", "Arctic and Alpine Research", "Canada's North", "Holarctic Ecology", "Information North", "Inuktituut", "Meddelser om Greenland", "Musk-ox", "Northline", "N.W.T. Gazette", "N.W.T. Hansard", "Northern Miner Magazine", "Northern Decisions", "Northern Engineer", "Northern Perspectives", "Northern Politics Review", "Northern Science Network Newsletter", "NORDECOL Newsletter", "Northwest Explorer", "Oikos", "Polar Geography and Geology", "Polar Record", "Press Extracts on Greenland", "Reports from the Kevo Subarctic Station, Finland" and "Up Here".
8. Annual Reports are held for some businesses doing work in the Northwest Territories, for example, Borealis Exploration Limited, Bow Valley Industries Limited, Canterra Energy Limited, Northern Canada Power Commission, Pacific Western Airlines and Esso Resources-Norman Wells Project.
9. Other Arctic related reports and books kept by the library include the following: Mackenzie Highway; Liard Highway; Canol Road; United States CRREL reports; F.E.A.R.O. hearings in the N.W.T.; plants and animals of the north; ice and permafrost; tundra and polar deserts; land use and land claims; northern communities; northern transportation and Arctic exploration.

The latest additions to the library's collection are given in the publication "Recent Acquisitions", which comes out irregularly. A pamphlet called "People and Services and You" gives a background on the library's history, resources and policies. These publications are available from the library.

The library is located on the second floor of the Bellenca Building at 4914-50th Street in Yellowknife.

Enquiries are always welcomed by the librarian and staff, namely the author and Barb Campbell.

NATIONAL LIBRARY OF CANADA SERVICES AND RESOURCES IN SUPPORT OF NORTHERN RESEARCH AND NORTHERN LIBRARIES

Mary Joan Dunn

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395 Wellington St., Ottawa, Ontario K1A 0N4 (819) 994-6949

Introduction

On behalf of Miss Marianne Scott, the National Librarian, I would like to thank the organizers of the seminar on northern and offshore information resources for inviting the National Library of Canada (NLC) to participate. It was a pleasure for me to represent the National Library.

I will give a brief overview of National Library services and collections, highlighting their relevance to northern research and northern libraries. I will focus specifically on our DOBIS system, which is available to you through the DOBIS Search Service.

Context of remarks

To put all of this in context, I'll start with a statement of the National Library's mandate, which is

- to promote the development of, and facilitate access to, library and information resources and services;
- to ensure the acquisition and preservation of, and access to, the published heritage of Canada; and
- to support Canadian studies;

and all of this for the benefit of all Canadians.

In fewer words, the National Library can be seen to have a dual responsibility — as **collector** of our national written heritage, and as **facilitator** in the sharing of Canadian library resources. These are, of course, very complementary roles, and of direct importance to information professionals and users of information on northern and offshore regions in the following ways:

- our collections provide a wealth of material in your field:
- we provide access to our own collections and to other collections in the country in a variety of ways;
- we provide access to supplementary information sources;

- we are working to provide a technical foundation which will make it even easier for Canadian researchers, librarians and information users to find and acquire the information and material they need.

Overview of NLC resources and services

NLC collections

The National Library aims to acquire all material published in Canada, and all material relating to Canada published elsewhere. By definition, this means NLC actively collects material on the Canadian North.

In addition to this 'Canadiana' focus, the National Library also collects generally material in the humanities and social sciences. CISTI, the Canada Institute for Scientific and Technical Information, collects generally in the fields of science and technology. Thus overall responsibility for all subjects pertinent to the North is split between the two institutions. At present, the National Library collections contain about 5,000,000 volumes.

To give you an idea of the scope of our holdings: in 1985 we undertook a study to assess the strength of our collections in support of Northern Studies. The study took the form of a comparison of our holdings to a sample of the Canadian items in the *Library Catalogue of the Scott Polar Research Institute*, and the *Catalogue of the Library of the Arctic Institute of North America*. We found that we held about 73% of the Canadian items held by the Scott Polar Research Institute, and about 60% of those held by the Arctic Institute of North America. In both cases, the highest amount of overlap was for monographs (85%, 67%) and official publications (82%, 63%).

This study indicates that overall National Library holdings in support of Northern Studies are significant. It is worthwhile also in this regard to note some of our specific sub-collections: for example, the Canadian Indian Rights Collection; our collection of masters and doctoral theses from many Canadian universities; our newspaper collection; our collection of Canadian and foreign official publications; and our special collections of music, children's literature, literary manuscripts, rare books, library and information science.

NLC collections do indeed offer a wealth of material in your field.

NLC services

Access to National Library collections

And we offer a variety of ways of accessing that material.

What I might term "direct, decentralized" access to certain subsets of the National Library collection is provided through a number of published catalogues and bibliographies and through several data bases.

The *DOBIS data base* contains the National Library's on-line library catalogue: bibliographic records for about 500,000 titles. All current cataloguing for our Canadiana and our non-Canadiana material is done on-line on DOBIS, and there have been a number of retrospective conversion projects for certain segments of the collection: we continue to whittle away at the huge job of not only converting existing manual catalogue records to machine-readable form in DOBIS, but in some cases of creating bibliographic records for our holdings for the first time. All types of material held by NL are represented in DOBIS.

Table 1

National Library of Canada Resources and Services in Support of Northern Research and Northern Libraries

The National Library of Canada has a dual responsibility: as *collector* of Canada's national written heritage, and as *facilitator* in the sharing of Canadian library and information resources.

NLC collections

The National Library aims to acquire all material published in Canada, and all material relating to Canada published elsewhere. NLC actively collects material on the Canadian North. The Library also collects generally material in the humanities and social sciences, and has many special collections such as the Canadian Indian Rights Collection, masters and doctoral theses from many Canadian universities, newspapers, Canadian and foreign official publications, music, children's literature, literary manuscripts, rare books, library and information science.

NLC services

The National Library provides access to its own collections and to other collections and information resources in Canada through a number of services including:

Reference services	(613) 992-0655 OONL. REFERENCE	Michael Williamson
Location Service/ Interlibrary loan	(613) 992-1752 COMPOSE.OONL	Kathryn Mikoski
DOBIS Search Service	(819) 997-7000 DOBISSEARCH.C	Marcia MacDonald
Canadiana services and products	(819) 994-6912	Drene Prentice
Union catalogue services and products	(613) 996-7507	Lorraine McQueen
Canadian Theses on Microfiche Service	(819) 997-7055	
Library Documentation Centre	(613) 995-8717 OONL.LDC	Beryl Anderson

The National Library offers many additional specialized services.

The mailing address for all is:
National Library of Canada
395 Wellington Street
Ottawa, Ontario
K1A 0N4

Records in the DOBIS data base can be accessed by names (including keywords in corporate and conference names), titles, subject headings, a variety of control numbers, including ISBN and ISSN, and classification numbers such as LC and Dewey. Boolean searching, however, is not provided.

Direct and decentralized access to the National Library's catalogue through DOBIS provides access never before available to Canadian libraries and researchers other than through consultation in the Library itself. In addition, even for material represented in published catalogues such as *Canadiana*, the national bibliography, DOBIS provides access to the records from the moment they are created, usually considerably in advance of their appearance in a printed or microfiche publication.

If you have an asynchronous terminal which can access Datapac 3101 or iNet, you can have direct access to the DOBIS data base via the National Library's DOBIS Search Service. The service is described in more detail below.

The availability for loan of NL material found in DOBIS is usually indicated in the bibliographic record; requests for NL material may be forwarded to the Library in the usual ways (no on-line ordering function is available); citation of specified data elements, such as the National Library call number, from the DOBIS record will speed the interlending process.

For decentralized access to the National Library collection, DOBIS provides you with access to the largest subset of our holdings.

Comprehensive access to National Library collections requires consultation of 3 major components: the DOBIS data base, the National Library card catalogue for catalogued material not yet represented in the on-line catalogue, and the National Library shelves themselves for uncatalogued items such as many of our newspapers, government documents and older materials. Consultation with National Library reference staff is essential to ensure a complete picture.

The *OONL data base*, available through CAN/OLE (see elsewhere in this volume), provides access to a Canadiana subset of the National Library collection: it covers essentially the monographic subset of the published *Canadiana* since 1973, (which is when NL began creating machine-readable catalogue records), thus monographs, theses, atlases, some microforms, and monographic government publications. The OONL file can be searched, using boolean logic, by keyword in title, author, subject, date, organization, language and format. For example, you can do a search for doctoral and masters theses related to the North and submitted to a Canadian university between specific dates. On-line ordering of items on the OONL file is provided: if a relevant citation is found, you can request it from the National Library immediately. All of the records in the OONL data base are in DOBIS and updates to the OONL data base come from DOBIS. You can access the OONL data base directly through CAN/OLE, or indirectly by using the National Library Computerized Information Service which is part of our reference service.

Moving from on-line to published catalogues, I will mention three:

The major one is *Canadiana*, the national bibliography, which has been published by the National Library since 1950. It represents the Canadiana subset of the National Library collection since that time. It is available in print and in recent years also in microfiche. The microfiche version offers a number of cumulating indexes, and multi-year cumulations. Most *Canadiana* records since 1973 are on DOBIS; *Canadiana* is now produced from DOBIS. *Canadiana* is available on a subscription basis.

In addition to the current bibliography, National Library also publishes a retrospective bibliography of Canadiana: *Canadiana 1867-1900: Monographs* is available by subscription (and the records are also in the DOBIS data base).

Canadian Theses which began publication as a printed bibliography in 1963 has recently been superseded by a microfiche product. the new product is generated from DOBIS. It is available on a subscription basis.

Access to National Library holdings is also provided through a number of published union lists which are discussed below.

I've described some ways in which NL provides, in effect, a direct line into its collections. Our *reference services* offer what could be termed "indirect" or "assisted" access to National Library holdings. One of the special skills NL staff bring to these services is an in-depth knowledge of the National Library collection, which allows them to exploit its strengths in responding to queries which can range from the quick reference question to the complex research consultation.

Our reference service provides back-up to libraries at local, provincial and federal levels. We serve individuals directly when they are formally referred by their local library, or if they do not have access to a library, or if their particular research requires use of National Library resources.

Access to other Canadian information sources

In describing National Library services to this point, I have focussed on how we assist users to access our own collection. Another important element in the National Library's mandate, and therefore in the services which support it, is facilitating access to other collections and information resources in Canada.

I will start again with our DOBIS data base. The DOBIS data base contains the *on-line Canadian Union Catalogue*. Over 300 Canadian libraries report their holdings to the National Library. Since 1980, all current accessions have been entered into DOBIS, and in addition, some retrospective conversion of the manual union catalogue (an enormous card catalogue) has been undertaken on a selective basis. Several libraries of universities who belong to the Association of Canadian Universities for Northern Studies report to the Canadian Union Catalogue (the University of Calgary, Carleton, University of New Brunswick, for example) and there could well be relevant and unique items reported for lesser known collections.

The DOBIS data base also contains all holdings reported to CISTI (see elsewhere in this volume) for the *Union List of Scientific Serials in Canadian Libraries* and in fact that product (both the hardcopy and the database) is generated from DOBIS.

A number of federal government libraries besides the National Library use DOBIS as an on-line cataloguing system, and their holdings are therefore available: the collections of CISTI, Environment Canada, the Library of Parliament, the Department of Communications, Public Works Canada, Statistics Canada, and Finance/ Treasury Board, among others, would be, I expect, of interest to northerners and northern scholars.

There are holdings of Canadian libraries attached to over one million of the records in the DOBIS data base. And from DOBIS we generate products: the *Union List of Serials in the Social Sciences and Humanities*, which is available on microfiche and also through CAN/OLE, the *Canadian Union Catalogue of Library Materials for the Handicapped*, CISTI's *Canadian Locations of Journals Indexed for Medline*.

DOBIS is a major tool supporting the National Library's *Location Service*, permitting as it does access to NL's own collection and to the holdings of many other Canadian libraries. The service also uses a wide range of bibliographic and location tools, including other Canadian and foreign data bases, in responding to requests, and we have a success rate of close to 80% in locating material.

The National Library *reference service* also, of course, goes beyond the resources of our own collections in serving our users. We maintain a large reference collection including catalogues of major research libraries and special collections such as the Scott Polar Research Institute. Reference staff also have access to 20 information retrieval systems, representing over 500 data bases containing Canadian, American and other international information. And of course, they use DOBIS. Reference staff also provide referrals to other sources of expertise and information, including special collections and experts in a particular field.

To mention briefly three examples of other ways in which the National Library facilitates access to collections and information resources in Canada:

Since the late 1960s, NL has published in microform and lent or sold the doctoral and masters *theses* of participating Canadian universities. Most of the ACUNS universities contribute to this program.

NL supports the Canadian Register of Research and Researchers in the Social Sciences (*CANREG*) produced at the University of Western Ontario and available on CAN/OLE. This data base contains information on scientists, research projects and publications in the social sciences, including multidisciplinary areas such as environmental studies.

Over the years, NL has supported and published results of *surveys of research collections in special libraries. Resources for Native Peoples Studies*, published in 1984, is one of this series.

Identification/access/networking initiatives

Everything I have dealt with so far the reader can use *now*, an existing service. I am going to turn briefly to some initiatives being taken by National Library to provide new and/or improved services in the future.

The National Library has developed a National Plan for Collections Inventories which calls for two concurrent and complementary efforts to identify collections in Canada. The first is the development of an *on-line inventory of Canadian library collections*, using the American Conspectus methodology adapted for Canadian use. An automated system which will permit us to create and maintain this on-line inventory is being developed now, and data on the collections of several CARL (Canadian Association of Research Libraries) libraries is being gathered. Libraries collecting this data are being encouraged to explicitly identify holdings of relevance to Northern Studies and the Canadian North to support future boolean searching and geographic access to important collections. At the present time, it is anticipated that the National Library will be able to offer on-line decentralized access to this inventory sometime within the next two years.

The second effort being undertaken is the creation of a *directory of special collections of research value*. Questionnaires to collect information are now being sent out.

A related initiative is the *Decentralized Program for Canadian Newspapers*, a decentralized, nationwide program for the preservation of Canadian newspapers in support of Canadian studies. Work is proceeding in the provinces and territories on establishing initial bibliographic control through the compilation of checklists. The development of a national union list of Canadian newspapers is a long term goal.

Several years ago, the concept of a voluntary, decentralized, nationwide library and information network was accepted by the Canadian library and information community. This concept recognizes the need for resource sharing among libraries in order to satisfy the increasing and increasingly sophisticated needs of library users. The mutidisciplinary nature of so much research and study today contributes to the complexity of this situation. This is true of Northern Studies as it is of other fields.

Among other networking initiatives, several of which I have just mentioned, the National Library has been working to develop and promote standards (called *protocols*) which permit different automated systems, using different hardware and software, to interconnect, or to communicate, with each other.

As the protocols are developed, the National Library is implementing them and encouraging and supporting their implementation by others. We are at various stages of work with a file transfer protocol, which we are using in a pilot made to distribute MARC records to three

Canadian libraries; an interlibrary loan protocol, which we are incorporating into a new automated interlibrary loan system we are developing; an acquisitions protocol; a cataloguing protocol; and a directories protocol which has the potential to facilitate identification of and access to many data bases and automated services. Many Canadian libraries and service providers are working with us on these networking activities and projects. Implementation of these protocols by many systems will facilitate access to them and exchange of information among them, to the benefit of Canadian libraries and their users. This is our long term goal.

DOBIS search service

I've mentioned DOBIS throughout this description of NLC services and collections, putting it, I hope, in context as a tool which allows us to fulfil our mandate. Now, I'm going to spend a few minutes on DOBIS itself and on our Search Service which allows direct access to the DOBIS data base.

The *DOBIS system* is an on-line, interactive system. Updates to the data base (new records, changed records) are immediately available to the on-line searcher. The system interacts with the searcher through a natural language, easy-to-learn dialogue; the dialogue is menu-driven, with a chain command feature for more experienced searchers; the dialogue is in English and in French. The system provides a variety of access points (names, titles, keyboards, subject headings, classification numbers, control numbers) for searching, but not boolean searching.

The *DOBIS data base* contains over four million bibliographic records and is growing at a rate of 400,000 records per year. This number includes machine-readable source files, such as the Library of Congress MARC records (1968 to date), machine-readable and manual accessions to the Canadian Union Catalogue, and records created on-line by participants in the federal government shared cataloguing system. It is important to note that the machine-readable files and the records input on-line reside together with minimal duplication in a single, shared file. It is an objective of the DOBIS system to create, for each bibliographic item, one common bibliographic record to which all libraries' holdings are attached. As you can imagine, this greatly facilitates searching and retrieval of needed information. There are holdings of Canadian libraries attached to over one million of the records in the data base.

The *DOBIS Search Service* offers search access to the DOBIS data base. The data base can be accessed directly via asynchronous terminals using the Datapac 3101 service. It is also accessible through Telecom Canada's iNet 2000 service. Training is a prerequisite for use of the DOBIS Search Service. We provide intensive 2-day group training sessions in centres across Canada. We train trainers. We provide support to service users in the form of documentation, a hotline and an ongoing assistance service. Charges for the service are reasonable. The data base is available from 7:30 a.m. through 8:00 p.m. Ottawa time, Monday to Friday. Additional information is available on request.

Note

This is a very brief overview of National Library resources and services with a special emphasis on Northern Studies. These are summarized in Table 1, page 206 (ed).

LIBRARY OF THE U.S. ARMY COLD REGIONS RESEARCH AND ENGINEERING LABORATORY, HANOVER, N.H.

Nancy C. Liston
72 Lyme Road, Hanover, New Hampshire 03755-1290 (603) 646-4221 or 646-4238

History of library:

The library was formed as U.S. Army Snow, Ice and Permafrost Research Establishment, Wilmette, Illinois in 1952; and was combined with Arctic Construction and Frost Effect Laboratory to form USACRREL in 1961. The book collection includes background scientific and engineering materials. The Bibliography of cold regions science & technology has been prepared by the Library of Congress for CRREL since 1951. For a brief period the Laboratory was known as the Terrestrial Science Center but returned to the Cold Regions Laboratory name.

Description of polar collection:

Entire library collection is maintained to support research on physics and mechanics of cold region materials, and on engineering in cold regions (Arctic, and areas with seasonal cold temperatures); subjects included in book collection are physics, mathematics, chemistry, geography and geology (including glaciology), meteorology, and engineering (especially soil mechanics). The polar collection is interfiled with our basic collection of science and engineering materials with the exception of the Cold Regions Bibliography collection on microfilm and microfiche. 60% of the Bibliography is Russian material with 10% in additional languages other than English.

Size of polar collection:

Books: 8,500. Periodical Titles: 350. Pamphlets and Reprints: 32,000. Microfilms: 490 reels (30-50 items) per reel — Chiefly items cited in SPIRE-CRREL bibliography. Microfiche: 75,000 units — Chiefly items cited in CRREL bibliography. Photographs: Available upon request from the CRREL Photo services element.

Acquisitions policy:

We respond to the needs of our research staff and collect in the areas mentioned in the description of our polar collection for inclusion in the Bibliography of Cold Regions Science & Technology.

Classification system used:

Hardbound books are catalogued using the Dewey Decimal System. Paper items are catalogued using accession number as location indication. "Cold regions" reports, documents, etc., since July 1968 are indexed only in the CRREL bibliography, prior to that abstract cards were interfiled in general catalogue.

Participation in bibliographic networks:

We are participating in OCLC. We are part of the Defense Technical Information Center system (DTICO, Alexandria, Virginia.)

Users policy:

Non-U.S. citizens must make prior arrangements for clearance. Hours of service, 7:45 a.m. to 4:00 p.m.

Interlibrary loan policy:

In accordance with ALA Interlibrary Loan policy. No charges.

Special Services Available:

We provide limited reference service by phone or correspondence. Computerized searches on SDC and Lockheed to our inhouse research staff only.

Copying facilities available.

Library publications:

Monthly current literature from the Bibliography on Cold Regions Science & Technology is available for distribution or exchange. This publication is cumulated into the annual volume. The annual bibliography and CRREL reports are available from NTIS, Springfield, Virginia. Our library accessions list and serials list is available upon request from CRREL library. Special publications are announced and available as advertised. The back issues of the Bibliography are also available from NTIS.

Additional comments:

The Bibliography of Cold Regions Science & Technology is available online from System Development Corporation, 2500 Colorado Avenue, Santa Monica, California under the name "COLD". It contains the Cold Regions Bibliography & the Antarctic Bibliography since 1968 and 1962 respectively. For additional details call (800) 421-7229 in U.S. or (213) 829-9463 outside the U.S.

Note

This paper was not presented in Yellowknife but was presented at an earlier NOIR seminar (ed).

CAN/OLE AND RELATED CISTI SERVICES: MEETING YOUR NEEDS FOR SCIENTIFIC AND TECHNICAL INFORMATION

Albert Joseph
The Canada Institute for Scientific and Technical Information (CISTI), Client Services CAN/OLE
National Research Council, Ottawa, Ont. K1A 0S2 (613) 993-1210

CISTI, the Canada Institute for Scientific and Technical Information maintains the national collection of scientific and technical literature for all Canadians. Of the many services it offers, four are described: CAN/OLE, CAN/SDI, Customized Literature Searching and Document Delivery.

Together these four services ensure that Canadians, requiring bibliographic information either on a one-time or continuing basis, are able to identify existing documents, and obtain from CISTI locations and/or copies of these documents.

CISTI

The Canada Institute for Scientific and Technical Information (CISTI) is a division of the National Research Council of Canada (NRC). CISTI maintains the national collection of scientific and technical literature for all Canadians who need specialized information.

CISTI's collection

CISTI's vast collection consists of 442,500 books and conference proceedings, 47,873 serials (including 29,211 active serials), and 2,035,609 titles in microform format (statistics for March, 1986). We collect all significant scientific, technical and medical journals and conference proceedings regardless of language or country of origin. We purchase books more selectively to ensure representative coverage of the major subjects.

Journal titles found in our collection include: Arctic Medical Research (Finland), Northern Engineer (USA), Acta Arctica (Denmark), Arctic and Northern Development Digest (Canada), and Problemy Arktiki I Antarktiki (U.S.S.R.).

Similarly, conference proceedings found in our collection include such items as, Arctic Offshore Technology Conference and Exposition and, Arctic Underwater Operations: Medical and Operational Aspects of Diving Activities in Arctic Conditions.

CISTI services

Besides maintaining this impressive collection, CISTI coordinates Canadian access to the MEDLARS system of the U.S. National Library of Medicine and operates a range of national information services including reference services, the Knowledge Source Index (KSI), the Canadian Index of Scientific Translations, CAN/SND — CISTI's scientific numeric database system, CAN/OLE — the Canadian OnLine Enquiry system, CAN/SDI — the Canadian Selective Dissemination of Information system, literature searching and document delivery, of which only the last four will be discussed in this presentation.

I would like to stress that anyone in Canada can use CISTI services, either directly or through a library. Fees, where applicable, are the same for all Canadians no matter where they are located.

CAN/OLE (Canadian OnLine Enquiry)

CAN/OLE is designed, operated and maintained by CISTI. It provides access to 23.9 million references from 37 scientific and technical databases including 21 that are of Canadian origin. CAN/OLE is available Monday through Friday, 6:30 to 21:30 (Eastern Standard Time), to all Canadians who have a dial up terminal, word processor or microcomputer which can communicate using ASCII code at a speed of 10, 30 or 120 characters per second.

Canadians who have a CAN/OLE account access CAN/OLE to identify, locate and order documents. They pay only for the time spent on the system and for printing costs. For example, a search on CAN/OLE can be undertaken to identify what has been published with respect to oil and gas exploration in the Beaufort Sea.

Some of the pertinent databases a user might consider for such a request include 9 of the 37 databases offered by CAN/OLE namely: AQUAREF Canadian Water Resources References, ASFA Aquatic Sciences and Fisheries Abstracts, BOREAL The Northern Database, CBCA Canadian Business and Current Affairs, CODOC Cooperative Documents Project (Official government publications), EI/EIM Engineering Index/Engineering Index Meetings, GEOREF Geological Reference File, NTIS National Technical Information Service.

Within 3 minutes the search is entered and the results printed:

```
@  enquire cbca
   OLE075XX 04/08/86 13:40
     $0.04      0.001 HRS OLE

CBCA (CANADIAN BUSINESS AND CURRENT
AFFAIRS) 1982-JAN/86

COPYRIGHT MICROMEDIA LIMITED

@  search (oil, gas), title, or
        001   11,115   SEARCH   OIL, TITLE
        002    7,401   SEARCH   GAS, TITLE
        003   16,612   OR 001:002
@  search explor*, title
        004    3,932   SEARCH   EXPLOR*, TITLE
```

```
@ and 3, 4
        005    1,299   AND 003,004
@ search (beaufort, sea), title, and
        006      370   SEARCH   BEAUFORT, TITLE
        007      995   SEARCH   SEA, TITLE
        008      113   AND 006:007
@ and 5, 8
        009       30   AND 005, 008
@ present 9, *, 1:30

        9/1
RE — 1433105
TI — NEW BEAUFORT SEA FIND RATED LARGEST IN
        CANADA
  •
  •
  •
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If necessary, the search can be saved and applied again immediately in a different database.

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@ savel 9, beaufort
   STRATEGY OF SET 009 SAVED AS "BEAUFORT"
@ enquire boreal
   OLE075XX  04/08/86  13:42
        $2.04      0.034 HRS CBCA
        $0.00         30 ONHITS          0  ABSTRACTS
        $0.00          0 OFFHITS         0  PRINTS
        $2.04    TOTAL ESTIMATED COST

BOREAL (THE NORTHERN DATABASE) CURRENT
TO FEB/86

COPYRIGHT BOREAL INSTITUTE FOR NORTHERN
STUDIES LIBRARY, UNIVERSITY OF ALBERTA
@ beaufort
        001      701   SEARCH   OIL, TITLE
        002      646   SEARCH   GAS, TITLE
        003    1,129   OR 001:002
        004      684   SEARCH   EXPLOR*, TITLE
        005       93   AND 003, 004
        006      567   SEARCH   BEAUFORT, TITLE
        007    1,824   SEARCH   SEA, TITLE
        008      521   AND 006:007
        009       20   AND 005, 008

@ present 9, *, 1:20

        9/1
RE  — 293997
HO  — 338:(G472) MCE
TI  — THE IMPACT OF BEAUFORT SEA EXPLORA-
        TION ACTIVITIES ON G.N.W.T. PROGRAMS,
        SERVICES, FACILITIES AND STAFF: THE INU-
        VIK REGION'S EXPERIENCE WITH TUKTOYAK-
        TUK 1976-1983

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Similarly, the saved search can be repeated in the same database following each update of that database and thereby provide a current awareness service.

CAN/SDI (Canadian Selective Dissemination of Information)

CAN/SDI is a personalized current awareness service operated and maintained by CISTI in cooperation with six other libraries. A user's profile of interests is drawn up and matched regularly against the databases relevant to the client's subject field. The resulting printouts of relevant references are sent monthly, biweekly or weekly depending on the update frequency of the databases searched. Subscribers to CAN/SDI have no need for a computer terminal or knowledge of computer searching. They need only arrange access to CAN/SDI by contacting one of the seven cooperating centres whose subject area is relevant to their needs or by contacting, where possible, the CAN/SDI search editor in their own organization. Once a profile is established, service continues on a pay as you go basis until the profile is cancelled. Modifications to the profile are welcomed at all times and are made at no charge to the subscriber.

Customized Literature Search Service

CISTI's Reference department provides, among others, a Customized Literature Search Service. CISTI has access to the databases of 16 online information retrieval systems. They are: CAN/OLE, DIALOG, ORBIT, BRS, MEDLARS, QL, INFOGLOBE, QUESTEL, WILSONLINE, STN, LEXIS/NEXIS, INSIGHT, I.P. SHARP, INFOLINE, ESA and DOBIS. The basic charge of $30.00 per topic covers a search on two online databases or 5 years of two printed indexes or a combination thereof.

Document delivery

The services described in this presentation result in records of the existence of documents. CISTI's Document Delivery service provides access to the actual item or the location of items not held by CISTI. CISTI received 318,422 requests for loans and photocopies during 1984/1985. This number is highest in not only Canada but also North America. CISTI's monographic works are loaned for a two week period and may be renewed on request unless there is a waiting list. Reference books, rare books and oversize volumes are not available for loan. New conference proceedings are non-circulating for one year unless a second copy is available. CISTI does not loan periodicals or reports on microfiche but provides instead photocopies of periodical articles or duplicate microfiche. Photocopies of conference papers of non-circulating new conference proceedings are also available.

There is no charge for loans. Registered mail is paid one way by CISTI and requesters pay for the return of the volume. There is no charge for the location service. There is a fee for photocopies, duplicate microfiche, and paper copy reproductions of microfiche.

Requests for loans may be submitted in person, by mail, telephone, telex, the ENVOY 100 or CNCP: Electronic Mail System or by CAN/OLE's CAN/DOC system.

Conclusion

With all of these resources and services CISTI is probably Canada's major mechanism for accessing scientific and technical information. We may be reached through all major communication channels.

LAND DATA MAPPING SYSTEMS AVAILABLE IN YELLOWKNIFE

Vol. 1: ENTIRE N.W.T.
Vol. 2: WESTERN N.W.T.
Vol. 3: EASTERN N.W.T. & HIGH ARCTIC

Descriptive Overview of a Manual Information & Retrieval System

Jamie Bastedo
Northern Land Use Planning Office, 2nd floor, Tundra Building, Box 1500, Yellowknife, N.W.T. X1A 2R3
(403) 920-8535

Purpose

As Northern Land Use Planning Program accelerates into a fully operational mode, the Yellowknife office has been preparing for a formal planning process by identifying the nature and scope of land-related information available locally. The purpose was to conduct an inventory of land data mapping systems used in various offices around Yellowknife and to compile the results of this inventory into a set of summary tables. It is hoped that these tables will be used to:

> 1. facilitate the process of data compilation and validation for land use planning purposes; 2. identify information gaps once specific information requirements have been spelled out by the Planning Commission; 3. promote the exchange of information between groups participating in land use planning; and 4. help to avoid inter-office duplication in mapping projects.

According to the Northern Land Use Planning Basis of Agreement (1983), the planning process will provide for "the conservation, development and utilization of land, resources, inland waters and the offshore." Therefore this inventory includes mapping systems pertinent to marine and freshwater environments as well as to terrestrial ones.

The summary tables are divided into three volumes. Mapping Systems available locally which cover all or most of the entire N.W.T. are described in Volume 1. Volume 2 describes land data mapping systems which cover all or part of the western N.W.T. while volume 3 describes systems for the eastern N.W.T. and High Arctic islands.

All three volumes are currently available through the Northern Land Use Planning Office in Yellowknife. Mapping systems in volumes 2 and 3 are summarized in the appendix to this paper.

Method

The three volumes include 11 summary tables which describe over 80 land data mapping systems which are referred to within various offices in Yellowknife and which deal in some way with land and resource information. All relevant offices were contacted and their mapping systems (if any) were described in terms of four broad categories.

> A. Map Specifications — specific features of each mapping system (ie. scale, coverage, medium, etc.). B. Physical Characteristics — nominal checklist for mapped data describing geological, aquatic and atmospheric aspects of the environment; C. Biological Characteristics — nominal checklist for vegetation data; wildlife data described in terms of habitat characteristics and use (ie. movement patterns, concentration area, etc.); and D. Human Activities — presence or absence of mapped data describing, through time (past "—", present "o" and potential "+"), various land uses and administrative mechanisms.

No effort was made to compare the mapping systems with respect to data quality or completeness. Therefore it is recommended that when searching for a particular type of information, several data sources be contacted.

Since documentating major land data sources is an ongoing activity of the Land Use Planning office, the information recorded here will be updated in future to include additional sources in Yellowknife as well as in other centres throughout Canada. As the results of our data inventory expand, the Land Use Planning office will likely be transferring the information to a computerized system which will allow searches according to map scale, coverage, type of information, and so on.

Appendix

TABLES, MAPPING SYSTEMS DESCRIBED IN VOLUMES 2 & 3 (Sample Titles)

Volume 2: Mapping Systems for Western N.W.T.

TABLE 1
- Dene Mapping Project
- Non-Renewable Resources Mapping Project
- Community Land Use Maps
- Renewable Resource Opportunities

- WCF Boundary Proposal Reports
- South Nahanni Watershed
- Hydrology Information Series
- Atlas of Wildlife Habitat Inventory Maps

TABLE 2

- Oil Exploration & Banks Island Wildlife
- Vegetation Types of the Mackenzie Corridor
- Landscape Survey in the Upper & Central Mackenzie Valley
- Environmental Program — Mackenzie Delta, N.W.T.
- Mackenzie Gas Pipeline Environmental Impact Assessment
- Mackenzie Valley Pipeline Impact Evaluation
- Hunting and Trapping Areas in the Inuvik and Fort Smith Regions
- Fur Bearer Series

TABLE 3

- Major Forest Fires
- Distribution of Selected Wildlife Species in the Inuvik Region
- Arctic Gas Biological Report Series
- Polar Gas Project Application
- Beaufort EIS Support Documents
- IPL Norman Wells Pipeline Project Reports
- Environmental Review & Assessment — Proposed Mackenzie River Dredging Project

TABLE 4

- Beaufort Sea Region Land Resource Study
- Shoreline Oil Spill Protection & Clean Up Strategies — Southern Beaufort Sea
- Mackenzie Mountains Region Baseline Study

Volume 3: Mapping Systems for Eastern N.W.T. and High Arctic

TABLE 5

- Lancaster Sound Data Atlas
- Eastern Arctic Marine Environmental Studies Atlas (EAMES)
- Inuit Land Use and Occupancy Project
- Atlas of Important Marine Habitats
- Ice Atlas of Canadian Arctic Waterways
- Arctic Atlas for Marine Oilspill Countermeasures
- Lancaster Sound Region Terrestrial & Marine Data Base
- Resource management Plan for Lancaster Sound Hydrocarbon Development

TABLE 6

- Arctic Ecology Map Series: Critical Wildlife Areas
- Important Areas of Polar Bear Distribution
- Important Areas of Ungulate Distribution
- Caribou Seasonal Range
- Caribou Monitoring Maps
- Northern Wetlands Research Project
- Recommended Caribou Protection Areas
- Lake Harbour Planning Project

TABLE 7

- Hydrocarbon Development in the Beaufort Sea-Mackenzie Delta Region — Northwest Passage Setting
- Viscount Melville Sound Environment Data Base
- Baffin Region Inuit Association Harvesting Study
- Arctic Pilot Project Integrated Route Analysis

ALASKAN ARCTIC INFORMATION RESOURCES

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I shall describe for you several Alaskan resources that can be of particular use as arctic information resources. In addition I will touch on the recently passed U.S. Arctic Research Policy Act of 1984, its implications for arctic information, and will report on a project to design an U.S. Arctic Information Network.

First, on a statewide basis, the Alaska State Library has funded the participation by the major Alaska libraries in the Western Library Network (WLN). WLN is a bibliographic utility that serves as a union list of member libraries. In effect, it is a giant automated "card catalog" to the holdings of all member libraries. Periodically, a microfiche catalog of the holdings of only the Alaska libraries is generated from the WLN data base and copies are distributed to all libraries in the state. This Alaska Library Network microfiche catalog (ALNCAT) is an excellent resource for arctic and Alaska materials, because all the major Alaskan collections are on WLN, i.e., the Alaskan holdings of the University of Alaska Libraries in both Fairbanks and Anchorage, and the U.S. Department of Interior's Alaska Resources Library. A complete new ALNCAT is scheduled for production in August, and copies may be obtained from Western Library Network, Mail Stop AS-11, Olympia, Washington 98504-0111, Attention: Bibliographic Products Librarian. The cost for the new edition is not set, but it will be under $100.

Probably the most important Alaskan repository of arctic information is the University of Alaska library system. The Rasmuson Library, together with the libraries of the Geophysical Institute and the Institute of Marine Sciences, make the University of Alaska-Fairbanks system the richest library resource in the state. Of particular interest, the Rasmuson Library is currently implementing a universitywide automated circulation system that will also house an on-line indexing system. Once implemented, this indexing system will provide access to a variety of specialized sources of Alaska information which will not be included in WLN.

My own agency, the Arctic Environmental Information and Data Center (AEIDC), a research institute of the University of Alaska-Fairbanks, is located in Anchorage (the center of federal activities in Alaska). Our mission is two-fold: (1) the transfer and dissemination of environmental information, and (2) applied research, particularly for problem solving of environmental issues in Alaska. For our purposes, the operative words are *transfer* and *dissemination*. We are not a repository, but instead, a referral center. It is our business to know who has what, and who is doing what.

To help in this referral mission, we produce the *Current Research Profile for Alaska*, an annual directory to research activities in Alaska and the arctic. This directory provides descriptions of over 1500 research projects, as well as the names, affiliations, and current addresses of the researchers. Since it is updated annually, it is the most current information available.

AEIDC has also developed an extensive microfiche inventory of Alaskan environmental literature. As standard practice, we microfilm the uncopyrighted publications, primarily university and government reports, received by the AEIDC library. Microfiche copies of these publications are available from us at $4.50 per title. Of particular interest to this group is the availability on microfiche of complete sets of reports published by: the Minerals Management Service Social and Economic Studies Program; the research institutes of the University of Alaska; the Subsistence Division of the Alaska Department of Fish and Game; and the released reports of the Alaska Oil and Gas Association (AOGA). (AOGA is the Alaskan counterpart of the Arctic Petroleum Operators' Association in Canada, but it is just beginning to release its reports for distribution. AEIDC is the official distributor of AOGA reports, but we have made arrangements with Pallister Resource Management (see elsewhere in this volume) for distribution through them. They are also, of course, available directly from AEIDC.)

AEIDC's own technical publications cover the gamut of arctic research. For example: mathematical models projecting environmental effects of development; literature surveys of Alaskan subsistence research; and cartographic work on the Alaska Department of Fish and Game regional habitat atlases.

The Alaska Climate Center, housed at AEIDC, maintains a complete collection of Alaska observations recorded by the National Weather Service. It can provide the raw numbers, or custom analysis of the climate data. One of their current projects is the evaluation of snow loads for site specific engineering design data. The Climate Center also runs the Alaska Avalanche and Fire-weather Forecast Centers.

On the national front, the Arctic Research Policy Act of 1984 (ARPA) formally expresses a U.S. interest in the Arctic and mandates a national Arctic Research Plan. All federal agencies doing research in the arctic are required to be in compliance with this plan. The National Science Foundation is the lead agency in writing the plan. NSF has given AEIDC a grant to design a national arctic information network. This network plan will be included in the update of the Arctic Research Plan to be submitted to the Congress in June 1987. The network's purpose is to increase research efficiencies by making it possible for a user (researcher, developer, or decision maker) anywhere in the U.S. to ascertain easily if information on a particular aspect of the arctic exists; and if so, how and where to obtain it.

The needs of users of arctic information will receive considerable attention and users' input will be actively collected throughout the project. The network design will include consideration of nonlibrary information and data sources (e.g., digital data bases, personal expertise), but will focus on the more traditional source of information, that is, the body of arctic literature.

We will design an arctic information network based on linking existing elements, strengthening them where necessary, and providing new elements for any gaps that cannot be otherwise covered.

The study of existing elements that control and manage arctic literature will include the following phases of particular interest: (1) an analysis of existing bibliographic data bases to ascertain their coverage of arctic subjects, as well as any problems or special techniques for extracting that information; (2) an evaluation of the various U.S. arctic collections utilizing the techniques of the Research Libraries Group (RLG) and the Polar and Arctic Regions Conspectus developed in Alaska by the Collection Development Project; (3) an analysis of the arctic "gray" literature problem and the various means to manage it; and (4) a characterization of existing arctic digital data bases.

While this project is for the design of a U.S. national network, the need for an expansion to an international network is obvious. Most especially, it cannot ignore the Canadian arctic sources and arctic information users. Further, there is precedent. One of the sponsors of this workshop, the Arctic Institute of North America, was founded with joint U.S. and Canadian funding. We are seeking comments and suggestions to alert us to any potential problems for international, and particularly Canadian, access or participation. Problems can often be avoided if they are considered early in the design of such a network. If any of you have relevant comments on existing resources, user needs, or Canadian-U.S. information exchange, please write to me.

Also, if I can be of any help to you with Alaska (and arctic) information questions, or if you want to order any of our publications, please contact me.

Note

This paper was not presented in Yellowknife but was presented at an earlier NOIR seminar (ed).

THE ARCTIC SCIENCE AND TECHNOLOGY INFORMATION SYSTEM (ASTIS)

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Scope

The Arctic Science and Technology Information System (ASTIS) is a multi-disciplinary arctic bibliographic database.

The geographic emphasis of ASTIS is on the Canadian Arctic and Canadian arctic waters, but the database also includes some relevant material on Alaska and Greenland and lesser amounts on the Scandinavian and Soviet Arctic. ASTIS covers all subjects, including the earth sciences, the life sciences, engineering and technology, the social sciences, and the humanities.

ASTIS began operations in 1978, and the database consists mostly of material published since the beginning of that year, as well as a small amount of older material.

The database currently contains about 18,000 citations, most of which have full abstracts and one or more location codes indicating libraries which hold the original document.

The ESRF/ASTIS project, which began in late 1984, will enhance the ASTIS database in some of the priority subject areas of the Environmental Studies Revolving Funds (ESRF). ESRF priority subjects include such topics as Ice Scour, Icebergs, Oil Spills, Marine Environmental Effects and Monitoring, and Socio-economic Issues.

Sources of information

ASTIS has five main sources of information:

1. The Arctic Institute of North America Library, a good general arctic collection.
2. The University of Calgary Library, where we scan monograph and government document acquisitions, as well as a list of selected serials.
3. The Ocean Engineering Information Centre at Memorial University, an invaluable source of information on the marine physical environment.
4. The ESRF Program Study Committees and the network of researchers engaged in ESRF studies, who will ensure that ASTIS' coverage of ESRF subjects is complete.
5. Pallister Resource Management Ltd., Calgary, Alberta, a major distributor of industry research reports.

Methods of access

ASTIS' publications and services include:

1. The ASTIS online database, available through QL Systems Ltd. QL's online search service is available worldwide, and we have customers searching the database from as far away as the Soviet Union. The *ASTIS/QL User's Manual*, containing the ASTIS thesauri, is available from QL.
2. The ASTIS Reference Service, in which ASTIS performs custom online searches for clients. Clients can phone or write with their search requests and ASTIS will return the results by phone, courier, or mail.
3. The bi-monthly *ASTIS Current Awareness Bulletin*, each issue of which contains about 400 citations with access by subject, geographic area, and author.
4. The annual microfiche *ASTIS Bibliography*, which includes the entire contents of the database with detailed subject, geographic, author, title, and serial indexes. Subscribers are sent a new set of fiche each year which cumulates all previous issues.
5. A series of special bibliographies on various subjects, many of which have been produced on contract for clients.
6. A series of bibliographies produced for the Environmental Studies Revolving Funds on the priority subjects of the Funds. As ASTIS completes its enhancement in each subject a comprehensive bibliography will be produced and published in the ESRF Report series. The first of these bibliographies, on Ice Scour, is now available from ASTIS. Three more bibliographies, on Fate and Effects of Arctic Marine Oil Spills, Icebergs Off the East Coast of Canada, and Training and Employment of Northern Canadians, will be available in the next few months.

Strengths and weaknesses

In summary, from the user's point of view, ASTIS' strengths are:

— its good basic coverage of Canadian arctic literature, particularly industry reports, plus the fact that the database will soon be comprehensive in some of the ESRF priority subjects;

— the fact that the database has full abstracts, document location codes, and detailed subject and geographic indexing;

— and the fact that there are so many different ways of accessing the information in the database.

ASTIS' chief weakness is simply the fact that our users would like the database to be larger. Except in a few very specific subject areas it is not yet possible to rely on an ASTIS search to be comprehensive.

DATABASES FROM THE BOREAL INSTITUTE FOR NORTHERN STUDIES LIBRARY

G.A. (Nita) Cooke

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The Boreal Institute for Northern Studies Library has searchable information on all of DOBIS, CAN/OLE and QL (see elsewhere in this volume).

For many years now we have been reporting our monograph holdings to the National Library, which can now be searched on their on-line database DOBIS. Our library symbol is AEUB.

Just last year (1985) our library cataloguing database was made available nationwide through CAN/OLE. The data is a copy of our database maintained on the University of Alberta's computer using the SPIRES database management system. This database (BOREAL) consists of all the cataloguing entered by the library since 1978 and now contains over 28,500 records. Updates are made monthly at a rate of approximately 400 per month. The records consist of original cataloguing of monographs, consultant reports, theses, pamphlets, etc. and analytic entries to articles from periodicals, papers from conferences, chapters from books, etc. received from the Scott Polar Research Institute at Cambridge, England. The data can be searched through a variety of indexes including author, title, keyword (which includes words from the abstract and title), UDC (Universal Decimal Classification), subject and place codes. (In CAN/OLE the letter G has been substituted for the asterisk (*) in the geographic UDC code.) Should you search the database on CAN/OLE and wish to borrow the item retrieved, this can be done either through CAN/DOC on-line document ordering service, a message on ENVOY 100 (address ILL.BOREAL) or through regular interlibrary loan.

The database BOREAL is used to produce several publications from the library — the *Library Bulletin*, which is a listing arranged by country of all items added to the database each month and the *BINS Bibliographic Series*, a series of minibibliographies on various topics issued each month. Both publications are available on exchange or by subscription.

It should be remembered that the Boreal Institute's library is multidisciplinary covering all subjects including fiction, and all reading levels, from children's literature to the highly scientific. The collection is area-oriented covering all circumpolar countries, with greatest emphasis on the Western Canadian Arctic, and with strong holdings also on the Eastern Canadian Arctic and Alaska. The present aim is not to be comprehensive in any particular area, but rather to maintain a strong general collection which will serve the generalist and give the specialist a good start. The collection is the only *general* northern collection in Canada.

QL Systems makes available two databases from the Boreal Institute — BNT and YKB. BNT (Boreal Northern Titles) consists of the data used to produce the monthly *Northern Titles KWIC Index*. This monthly current awareness publication is derived from the headlines of newspapers and the first named author and title of articles from periodicals, government documents, and other ephemera received each month by the library. These entries embrace all subjects (such as economic development, native peoples, pipelines, health, education, etc.) pertaining to the arctic and subarctic regions of the world. Coverage is particularly strong on items relating to the Canadian North, Alaska and Canadian native peoples. Foreign language material is included if it contains an English title and summary. On QL systems the database is divided into three fields — title, author, and source. In general the words in the headline or title are used and no attempt is made to conform to a standard vocabulary. Thus when searching for references on native peoples not only should that term be used, but also Indian, Dene, Metis, Inuit, Eskimo. A few recognizable abbreviations are used such as BC. for British Columbia, NWT for Northwest Territories, TV. for television and sometimes a few explanatory terms are added after the word RE eg. RE PIPELINE, RE LANDCLAIMS. It should also be remembered that the titles of some of the sources contain words which might also be in the headline eg. YUKON INDIAN NEWS, NATIVE PRESS. Therefore if searching for references using these terms it is wise to limit the search to the title field using the @1 command. Conversely, if you want a listing of all articles indexed from a particular newspaper or journal, this can easily be obtained by restricting the search to the source field. Updating data is sent to QL every 3 months. As of December 1985 the database contained 136,426 items.

The other database produced by the Boreal Institute's Library and made available through QL systems is YKB — Yukon Bibliography. This contains the data used to publish the Institute's *Yukon Bibliography Update to —series*. At the moment the database contains 4,160 items making references available which were published in 1982 or earlier. This database is only updated with new data as another edition in the series is finally edited and ready for publication. At present the issue *Update to 1983* is in final editing and will be available for searching in the summer. Therefore the value of this database is in providing baseline references from which a more current search can be made by other means. Geographically, all items in the database are limited by the present boundaries of Yukon. General reference to the "North" is avoided unless it provides a minimum of one chapter or one page in a periodical on Yukon as a separate entity. The references include books, government and consultant reports, theses and articles from periodicals. References to maps, newspaper articles, air photos, films and other non-book materials are not included.

The library of the Boreal Institute for Northern Studies hopes that these databases will be useful to northerners and northern scholars and are only some of the services we offer. If you have a question, try us — one way or another we should be able to give you an answer.

WORLD DATA CENTER-A FOR GLACIOLOGY BOULDER, COLORADO: ACTIVITIES AND SERVICES

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Introduction and historical overview

World Data Centre-A for Glaciology [Snow and Ice] (WDC) is one of three international data centers serving glaciology. The other two are WDC-B in Moscow, USSR and WDC-C in Cambridge, England. The centers, established during the International Geophysical Year, serve to facilitate the international exchange of data on all forms of snow and ice (avalanches, freshwater ice, glaciers, ground ice and permafrost, ice sheets, paleoglaciology, sea ice, and snow cover).

In 1976, the National Academy of Sciences, Geophysics Research Board proposed that WDC-A be transferred from the U.S. Geological Survey in Tacoma, Washington to Boulder, Colorado, where it would be operated under a joint arrangement between U.S. National Oceanic and Atmospheric Administration (NOAA) and the University of Colorado. This transfer was implemented in November 1976 and WDC-A was formally included among the WDC responsibilities then exercised by the Environmental Data Service of NOAA represented by the National Geophysical and Solar-Terrestrial Data Center (NGSDC).

The WDC continues to operate under a contractual agreement between the University of Colorado, Cooperative Institute for Research in Environmental Sciences (CIRES) and the National Environmental Satellite, Data, and Information Service (NESDIS) of NOAA. Colocated with WDC is the National Snow and Ice Data Center (NSIDC) established by NOAA in 1982. This center functions as a national information and referral center for the snow and ice community. Many of the data sets held are common to both WDC and NSIDC although some are only available within the latter organizational framework for practical as well as policy reasons.

Current programs

The Information Center and the publications program are two of the principal functions of WDC/NSIDC. Under the ICSU Guidelines, WDC's are to "collect, store, and disseminate information and data on Glaciology". (see International Council of Scientific Unions. Panel on World Data Centers, (1979) *Guide to International Data Exchange Through the World Data Centers.* 4th ed. Washington, D.C. 113p.) WDC/NSIDC maintains an active ongoing program to acquire published material in all areas of snow and ice research and serves as an archive for both published and unpublished data and information. Currently, the Information Center contains 4000 monographs and technical reports, 8000 reprints; 70 serials are regularly received. During FY85, approximately 1500 items were added to the collection. All materials received are catalogued and assigned subject and geographic descriptors. Primary access to the collection is provided by CITATION, the in-house online catalog. At the end of 1985, there were 19,000 records in the data base. The file is updated quarterly and 400-500 records are added each time. The subject headings in CITATION are those used by the Cold Regions Research and Engineering Laboratory, Hanover, N.H., in their CRREL bibliography and COLD data base. Our collection holds materials on all aspects of snow and ice research, however our focus in recent years has concentrated on snow cover and sea ice data and information and the effects of the cryosphere on climate. Online searches of the collection are performed on request. Remote access is not currently available, but we are happy to accept telephone or written requests for information. Additionally, if a document is found in our collection, we are happy to provide a copy to the user on a cost-recovery basis. A document delivery servive is very important to the researcher in glaciology because of the interdisciplinary nature of the research (covering geology, geography, geophysics, engineering, and climatology) and the diversity of sources which publish snow and ice material. Microfiche indexes also offer user access to the collection. Author, title, subject, and geographic indexes are available for material received and catalogued through June 1985.

Because WDC is a research center as well as an information center and archive, our in-house scientific staff is available to respond to specific questions or to consult on research projects. Their expertise includes climatology, remote sensing, snow cover and avalanches, sea ice and data management.

Two series, *New Accessions List* and *Glaciological Data*, are published by WDC/NSIDC. *New Accessions List* is a product of the CITATION data base. It is a quarterly list of documents, categorized by subject, received and catalogued during a given period. This publication which fills much of the information exchange role stipulated by World Data Center System guidelines is mailed worldwide to about 350 scientists, research institutions, and libraries.

Glaciological Data (*GD*) is published on an irregular basis, approximately twice a year. Issues focus on a single topic and include specialized bibliographies, inventories, and survey reports relating to snow and ice data prepared by WDC/NSIDC staff, as well as invited or contributed articles on data sets, data collection and storage, methodology, and terminology in glaciology. Current circulation for *GD* is approximately 950 copies, 50 percent of which are mailed to addresses outside the United States. Two issues were published in 1985.

GD-16, *Soviet Avalanche Research; Avalanche Bibliography Update, 1977-1983* includes eight translations of Soviet research on avalanche dynamics conducted at the Problem Laboratory of Snow Avalanches, Moscow State University and a paper by CIRES scientists evaluating the Soviet work. Financial support for the translations was provided by the Rocky Mountain Forest and Range Experiment Station of the USDA Forest Service. Also included in *GD*-16 is a 450 citation avalanche bibliography updating the one published in *GD*-1 in 1977.

The Marginal Ice Zone Bibliography was published as *GD*-17. This issue provides a major bibliography on sea ice, meteorology, and oceanography in the marginal ice zone, an area of critical importance to our understanding of the mechanisms of sea ice growth and decay and the focus of a major DOD (ONR)-sponsored research program. There are approximately 900 citations in the bibliography with both author and subject access.

The next scheduled issue in the series will be the proceedings of "Snow Watch 85." It will report the results of a WMO/DOE/NSF/NOAA-sponsored workshop reviewing the available information on the potential role of seasonal snow cover in CO_2-induced climatic change.

Data set administration

WDC/NSIDC has digital archives on various areas of snow and ice research. The majority of data sets held are of snow cover and sea ice, but there are also data relating to glacial geophysics, Great Lakes ice-related studies, and satellite microwave research.

Snow cover data sets include: global mean monthly observed snow depth, weekly hemispheric snow cover extent since 1966, Greenland snow stratigraphy, as well as published snow survey data for the U.S. and Canada.

Sea ice data sets include: Northern Hemisphere gridded data for 1901-1976, Southern Hemisphere ice limits for 1972-1980, weekly gridded digital ice charts for 1966 to the present, and sea ice concentration and multiyear ice fraction for regions north of 30°N and south of 50°S latitudes, both derived from Nimbus 7 Scanning Multichannel Microwave Radiometer (SMMR) polarized antenna temperature data.

The Center also has charts of snow and ice limits for most areas of the Northern Hemisphere.

WDC/NSIDC archives selected data sets relevant to climatological as well as glaciological research. Examples include: Great Lakes ice data, collected by the Great Lakes Environmental Research Laboratory (GLERL), Ann Arbor, Michigan, comprising surface observations, aerial photography, and climatic indices; Airborne polar ice sounding and geomagnetic data from Antarctica and Greenland, consisting of digital and analog data collected by National Science Foundation, Division of Polar Programs-sponsored remote sensing flights.

The photo collection consists of about 10,000 aerial and terrestrial photos, including an historical set representing the work of many U.S. and foreign glaciologists since 1880. These photos constitute an original record of past glacier and snowline positions. High points are the photographs of Alaskan glaciers taken by H.F. Reid, A. Curtis, A. Johnson, and W.O. Field. An index and microfilm browse file to the 80,000-item collection of aerial photographs of Alaskan and Canadian glaciers taken by Austin Post and colleagues for the U.S. Geological Survey is also available.

Defense Meteorological Satellite Program (DMSP) data

NSIDC has served as national archive for data from the U.S. Air Force Defense Meteorological Satellite Program (DMSP) since March 1983. Imagery, archived in Boulder under contract to NOAA/NESDIS/NCDC/Satellite Data Services Division, consists of approximately 1 million pieces of positive transparency film providing global coverage since 1973. Data from the visual (0.4-1.1 m) and thermal infrared (10.5-12.5 m) spectral bands are archived. One of the film products archived (from direct readout data) has the highest resolution (0.6 km) of any meteorological satellite imagery. DMSP data are used in many publications. Most notable are a new National Geographic Atlas of North America, the Western Snow Conference brochure cover, and an article on city lights and fires visible from DMSP at night in *Co-evolution Quarterly*.

Cryospheric Data Management System

The Cryospheric Data Management System (CDMS) is primarily designed to provide an archive of cryospheric data extracted from the Special Sensor Microwave/Imager (SSM/I) which will be launched in mid-1986 as part of the Defense Meteorological Satellite Program. Besides maintaining an archive of SSM/I data, CDMS will perform other functions: create gridded data sets; provide an interactive data catalog of CDMS data sets, including information on the availability and location of other types of data; distribute data and any data products created by the CDMS to the user community; and, incorporate other snow and ice data sets into the CDMS archive.

These are the highlights of the activities and services of WDC/NSIDC. We will be glad to supply detailed information on any aspect of our program.

Note

This paper was not presented at Yellowknife but was presented at an earlier NOIR seminar (ed).

DESKTOP GEOGRAPHIC INFORMATION SYSTEMS — A CASE STUDY IN WOOD BUFFALO NATIONAL PARK

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In the past it has been difficult for persons in remote or small centres, to access the wide range of available data banks efficiently. Individuals tend to organize a basic personal library which, in time, is merged with others to produce a library for the group. As the library grows there is a natural tendency for volumes and papers to accumulate on peripheral subjects and in time it becomes very difficult for individuals to find information quickly. At this point bibliographies and mini-information retrieval systems must be developed to locate documents efficiently, because otherwise time is wasted in locating documents or specific information in documents. The advent of the microcomputer was welcome because it became possible to store information in great quantities and yet to have it available at the touch of a button.

Information management is important to any group that owns, controls, or has an interest in large landscapes. Examples would include National Parks and other conservation areas, trapping areas, wildlife management areas, timber reserves and watersheds, to name only a few. We are assuming that these groups already have large libraries and there is a realization that an information system is required in order to accumulate important information and then to ensure that this information is always readily available.

The objective of this paper is to provide a case study of a landscape in a national park where a Geographic Information System is utilized to aid in planning and management.

Geographic information systems (GIS)

Information systems (Burch *et al.* 1983) and GIS (Canadian Institute of Surveying 1984, Marble *et al.* 1983) have been used since the advent of computers; in general there has been an emphasis on large capacity hardware. In Canada, the well-known Canada Land Information System was set up in the 1970's as a nationwide depository of land and resource information, (Crain and MacDonald 1983). In recent years many smaller supporting software systems and micro computers have become readily available and these offer tremendous advantages over hardcopy reports, maps and aerial photography. Computerized GIS is a very cost-effective way of storing and retrieving large quantities of data with a uniform format. Data base management programs are simple so data are easily stored, easily retrieved, but just as importantly, data can be easily corrected and further information can be added at any time.

Decreases in the cost of hardware and software have been substantial in the past few years, so it is now possible for most offices to purchase the equipment. In addition to running the geographic system, the hardware would likely be used for many other office activities, including word processing, budgeting and inventory control. As with any technology there are initial disadvantages or personnel considerations as the new technology is implemented in an office. A minimum of training is required for someone to utilize the GIS. In addition, it should be realized that time is required periodically to update and to modify the data in light of the requirements of the group. Without updating the data bank will lose its usefulness and will tend to be ignored. As for hardware, there is a high initial expense and equipment becomes outdated rapidly. Software is changing rapidly and once an office is committed to such a development, there will be expenses associated with keeping abreast of updated and more efficient software. Difficulties arise if hardware and software are not compatible between offices that in the future wish to share data.

Wood Buffalo National Park — A case study

At 44,800 km², Wood Buffalo National Park is Canada's largest and one of the world's largest National Parks. The park stretches almost 300 km from 50°05' to about 60°32' north latitude. It is bounded on the east by the Athabasca, Embarras, Des Rochers, Slave, Salt and Litle Buffalo Rivers and on the west the boundary is partly 150°36' east longitude and partly 114°00' east longitude. The Caribou Mountains to the west and the Birch Mountains to the south rise to a maximum elevation of approximately 1000 m and 850 m, respectively. The remainder of the park has an undulating relief and lies between 200 and 300 metres, sloping to Great Slave Lake which is slightly over 150 metres above sea level.

Geologically the park has the largest gypsum-karst terrain in the world and the salt-bearing formations produce saline conditions in approximately 250 km² of the park. Karst topography also accounts for the approximately 1000 sink holes and the underground rivers, caves and sunken valleys on the landscape.

Hydrologically, the Peace and Athabasca Rivers drain into the Peace-Athabasca Delta, which is the largest inland freshwater delta in the world, at the west end of Lake Athabasca. The water then moves north into the Slave River and eventually moves into the Mackenzie River system.

The park was established in 1922 to protect the 500 wood bison that remained from the estimated 50 million that roamed over a large part of North America. This population now contains approximately 5000 animals. The whooping crane, which is well known as a rare and endangered species, nests in the park, as does the peregrine falcon. The park lies in the tension zone between the boreal forest to the north and the prairie to the south and therefore, vegetation from both zones is easily identified. Large areas of forest are dominated by jack pine, trembling aspen, white spruce, black spruce and larch; there is discontinuous permafrost in the extensive areas of organic terrain in the northern part of the park. In the 4,800 km^2 Peace-Athabasca Delta, in the southern part of the park, there are extensive areas of sedge meadow and willow-dominated vegetation.

The park ecosystems are far from static in character. For example, the hydrological regime has been changed significantly since the 1968 completion of the WAC Bennett Dam on the Peace River in British Columbia. This has reduced peak flows and extensive flooding in the Peace-Athabasca Delta now occurs less frequently than before the dam was built. The vegetation and dependent animal species are adjusting to this changed hydrological regime. A second example of ecosystem dynamics is found in the forested areas that cover about 70% of the park. Here, fires have been important in changing the age structure of the forest and animal populations; approximately 20% of the park burned during the three year period of 1979, 1980 and 1981.

All of the above information has accumulated in a library of considerable size. A card catalogue is used to locate books, reports and maps and hard copy bibliographies have been produced (e.g. Scace 1974, Air Photo Analysis Associates 1979). A Wood Buffalo National Park bibliography is being updated and will be available through a microcomputer and a data management system that retrieves references by calling authors, publication dates, key words, or geographic locations. Files could also be developed for available maps and air photos. Updating is a simple procedure and when specific information is required the files can be searched and a list of the appropriate references, maps or photos can be printed out for the client.

In the mid 1970's, a biophysical inventory of Wood Buffalo National Park was completed at a scale of about 1:100,000 (Airphoto Analysis Associates 1979). The final reports are available in hard copy form in libraries and in the form of a digital data bank known as "WOODBUFF" which is stored at the Canada Land Information System in Ottawa. The data bank is based on Northwestern UTM units and consists of approximately 1000 polygons with sub-units. The polygons range widely in size; about ten are 40,000 ha or larger, while well over fifty are less than 50 ha. To each of the polygons is attached an attribute file, which includes geological, edaphic, aquatic, and biological data. The attributes are accessed through the polygon number or through a characteristic of the attribute file. The complete park or individual map sheet (1:250,000 scale) can be searched during an individual run. Unfortunately, although "WOODBUFF" contained a large quantity of useful information, it was not readily accessible to managers in Wood Buffalo National Park until recently. In September of 1985, the Canada Land Information System office transferred the WOODBUFF data base on magnetic tapes to the University of New Brunswick Fire Science Centre. The information was registered in the Computing Centre and a tape scan was conducted to verify the associated printed documentation. A working copy was then prepared to be accessed through a desk top microcomputer with locally available data base management programs (d BASE II).

The present usefulness of the data bank is that it can be used by park managers to retrieve the stored information about any part of the park. Errors can be corrected and additional information can be added at any time. It should be noted that many attributes change only slowly or over long intervals. For example, many of the hydrological features and certainly most of the geological features need only be verified or corrected as necessary when more specific sites are visited in the field. Other attributes change more quickly; for example, since the data bank was developed, the forest types in the recently burned areas have disappeared and new forests have begun to develop.

We wish to mention just briefly that this WOODBUFF data bank is basic to natural resource and fire management programs that require a dynamic geographic information system.

In our research, this will require the transfer of the WOODBUFF data bank to a larger computer that will be operated under a more complicated geographic information system called, "CARIS" (Computer Aided Resource Information System) which can be used in both cartographic and resource mapping applications (Masry *et al.* 1984). CARIS will be linked to a satellite imagery processing system (ARIES II) which enables an economical updating of the attribute files (Morin *et al.* 1986). Essentially, the recent satellite imagery is overlain on the old polygons and then the polygon shape can be changed or attributes can be modified.

CARIS will enable the utilization of spatial inventory data as input to mathematical models that predict the change in forest development (biomass or fuel) over time or that predict the change in animal populations over time and space. Thus we will be able to investigate long-term ecological problems and to devise alternative management strategies for managers who wish to achieve certain goals.

The WOODBUFF data bank on the CARIS can also be a very useful decision support system for day-to-day management such as fire management. Weather can be monitored on a daily basis over the season to establish the drought level in the vegetation (fuel). When a fire location is established, the data bank will be queried for the fuel types surrounding that ignition point; then, by utilizing ambient temperature, relative humidity and wind speed and direction in a fire behaviour model, the fire direction and rate of spread through the fuel types can be predicted over the time period supported by the weather forecast. If the management goals for the area can be achieved by a fire at this time and if there are no resources that must be protected in the predicted burned area, then the fire could be permitted to burn while being monitored closely. If, however, the goal of the area can only be achieved through protection from fires, then the manager can dispatch the appropriate number of personnel and quantity of equipment in relation to the predicted fire behaviour. This system will be similar to those described by Kessell *et al.* (1984) and Kourtz (1984) for day to day fire management purposes.

Is the desktop GIS for you?

Hardware and software are developing rapidly. Memory and computational speed can easily be expanded and more peripherals such as plotters, digitizers and recorders can be supported. Software for satellite imagery analysis or thematic mapping, to name only two areas, is being marketed by a number of companies. As the potential purchaser faces the range of options, it is necessary to carefully determine if the selections can service the present needs and the needs predicted for the next one to three years. For many management teams the system will become overloaded quickly because of unforeseen applications so it is important to predict future needs.

It will also become obvious that external groups wish to cooperate on hardware, software and data sharing. If compatible hardware is purchased initially, then greater flexibility will be available when equipment malfunctions. Compatible software will remove the need for translation packages which can be expensive and time consuming to produce and utilize. Compatibility for a large area such as the Northwest Territories, which has many interested groups with a wide variety of needs (Nichols 1985), is exceedingly difficult to achieve initially but, if achieved, high dividends in efficiency will accrue in the future.

Possibly, the best advice that can be given to a potential purchaser and/or user of a GIS is to visit with a group or agency that is already involved in similar types of work. When you are convinced that this new tool will make your management or research job easier, then you will benefit most from the new technology.

We acknowledge the many types of support provided by Parks Canada and in particular Wood Buffalo National Park personnel as we continue to develop our study. Financial operating and equipment support came primarily from the Natural Sciences and Engineering Research Council of Canada and the Donner Canadian Foundation. Ross Wein was on sabbatical in the Department of Land Resource Science, University of Guelph, Ontario, when this article was written.

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CANADIAN SEA ICE INFORMATION SYSTEM, C-CORE

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One of the most significant developments for access to sea ice and iceberg information is the online database, the Canadian Sea Ice Information System, known as CSIIS, which has been developed over the last two years at the Centre for Cold Ocean Resources Engineering (C-CORE).

The database is an important step in information technology, setting a standard on how information in written documents and raw data sources can be handled on one database. The Canadian Sea Ice Information System provides online access to marine ice information for Canadian waters.

CSIIS is much more than a bibliographic database, although it does have that feature as a small component of the system (using the software Data Trieve for those who are interested). CSIIS actually looks inside the written document and abstracts, compiles and analyzes all quantitative and qualitative marine ice data. The database has the capability to manipulate the ice information both graphically and statistically in the form of point distribution, drift track mapping, frequency histograms and x-y line plots. The marine ice information on the database including sea ice and icebergs has been collected from many documents and raw data sources. The Ocean Engineering Information Centre in St. John's, Newfoundland, is the major resource centre for sea ice and iceberg documents. This collection concentrates on collecting the "grey" or fugitive literature in cold ocean engineering.

The CSIIS database has a very user-friendly, menu-driven format developed for a user not familiar with online systems. There are help displays available at all menu levels within the system.

On entering CSIIS, the user is prompted for selection criteria from a hierarchy using the following order:

1. Geographic Area — The user can select up to 3 predefined areas or select an area contained within particular latitudes and longitudes.
2. Date — The user specifies the time period of interest. The system has data from 1900 to present.
3. Ice Type — The user selects one ice type:
   - — Sea Ice
   - — Glacier (iceberg)
   - — Artificially Thickened
4. Class — The user may choose data from 5 classes:
   - — Distribution
   - — Movement
   - — Morphology
   - — Physical Properties
   - — Mechanical Properties
5. Attribute — Depending on the class (or classes) chosen, the user is presented with a list of relevant attributes (i.e. concentration, thickness, tensile strength etc.) from which 5 may be chosen.

Once the search strategy has been compiled, a search of the database is undertaken and a summary of the data is presented.

Five information formats are available —

1. Raw Data
2. Author Statistics
3. Text Files
4. Histograms
5. Track Maps

Analysis of raw data files can be undertaken using a statistics package. Author Statistics files present tabulated statistical information. Text files are used where only qualitative descriptions have been provided in the original document. Histograms are used to display grouped frequency data contained in the original report. Track maps are used to plot the movement of icebergs and sea ice floes for which drift data are available. Three ice concentration data sets for the Canadian Arctic and east coast are also available on CSIIS.

When CSIIS retrieves data from a report, the user may request a map showing the location at which the information was collected. The number next to the location symbol is an identification number which is assigned to each information file stored in CSIIS.

Ice concentration data for the Canadian Arctic and East Coast are indexed by grid point locator. When the user specifies the area of interest, an index map is presented showing the location of all grid points in that area. By entering the index number of a specific grid point or set of points, the user may retrieve a histogram which shows the frequency of ice concentrations at that location for the portion of the ice season which is of interest. It is possible to focus on only old ice, only first-year or all ice types present.

CSIIS is operated at Memorial University and is accessible through Datapac. The system is operated on a cost recovery basis. An annual membership fee will be charged to cover the cost of the user manual and the associated newsletter which will be circulated at regular intervals. Other costs will include hourly connect charges and CPU time.

Note

This paper was not presented at Yellowknife but was presented at an earlier NOIR seminar (ed).

GEOSCAN: A BIBLIOGRAPHIC DATA BASE FOR CANADIAN GEOSCIENCE LITERATURE

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GEOSCAN is a data base which provides bibliographic, geographic and subject access to publicly available geoscience literature concerning the Canadian landmass and offshore regions. This bibliographic data base is cooperatively produced from the indexing contributions of twelve federal, provincial and professional geoscience organizations located throughout Canada. The Geological Survey of Canada coordinates these indexing activities and provides computer resources in support of this project.

Document types covered in GEOSCAN include published serials, periodicals, theses, published and unpublished maps, open files and mineral assessment reports. GEOSCAN's data base structure is based on the UNISIST guidelines for bibliographic data and is supplemented with additional fields for geographic and subject information. A standard approach to indexing is maintained through use of a thesaurus, controlled authority files and detailed indexing documentation. GEOSCAN indexing is performed by geologists and the data base can be updated using either interactive or batch methods.

GEOSCAN is maintained on a Hewlett-Packard 3000 minicomputer and the data base is managed using MINISIS software. The HP3000 minicomputer is located in Ottawa and participating organizations access the system using the Canadian telecommunication network Datapac. A wide range of paper and microfiche products are produced from GEOSCAN and it is anticipated that the data base will be publicly available through a commercial vendor in 1986.

Introduction

Controlling a nation's information base in any scientific discipline is a mammoth task in the best of circumstances. However, consider for a moment the case of controlling the geoscience literature for Canada. Canada has a land area second in size only to that of the USSR, the longest coastline in the world and an offshore area that is 60 percent of its onshore area. Due to the importance of the mineral and energy sectors to Canada's economy, a disproportionately large geoscience knowledge base has been built up and continues to increase rapidly. However, Canada is a nation of 25 million people and we have only a small population of professionals to control and access this important knowledge base. How could we cope with a widely scattered yet rapidly increasing literature base? How could the "grey literature" be brought under control? How could wasteful duplication of efforts be avoided by this small population of geoscience information professionals? These were the concerns facing the Canadian geoscience community in the mid 1960s and like many other nations, Canada turned to data base building as one method of controlling its geoscience literature.

Senior representatives of provincial and federal governments, academia and industry, who were members of the National Advisory Committee on Research in the Geological Sciences (NACRGS) turned their attention to the situation in 1965 by appointing the *ad hoc* Committee on Storage and Retrieval of Geological Data in Canada. A sequence of gradually more detailed studies by the latter Committee led to a set of recommendations which were presented to, and accepted by, the Conference of Provincial Ministers of Mines and NACRGS in 1967 and 1968. Action on these recommendations led to the creation of the Canadian Index to Geoscience Data in 1969. In 1979 the name of the data base was changed to GEOSCAN.

GEOSCAN indexing network

The GEOSCAN data base is produced through the voluntary indexing efforts of 12 Canadian geoscience organizations. Participating organizations include eight of ten provincial governments (only British Columbia and Manitoba do not contribute records), three federal government agencies and one professional society.

	# of records
Newfoundland and Labrador Department of Mines and Energy	6 669
Nova Scotia Department of Mines and Energy	7 551
New Brunswick Department of Natural Resources	3 423
P.E.I. Department of Energy and Forestry	68
Ministère de l'Énergie et des Ressources, Québec	18 821
Ontario Geological Survey	17 629
Saskatchewan Department of Mineral Resources	5 732
Alberta Geological Survey	2 769
Canadian Society of Petroleum Geologists	2 334
Department of Indian Affairs & Northern Development (Canada)	6 855
Department of Energy, Mines and Resources (Canada)	
Geological Survey of Canada	21 881
Earth Physics Branch	671

This cooperative approach to data base building has resulted in coverage of a larger population of documents. Indeed, many types of documents indexed by provincial participants would be difficult for a centralized indexing system to acquire and index. A cooperative approach spreads the total workload over a number of organizations and thus insulates the data base from budgetary problems or other difficulties in any one organization. In the Canadian situation it would be difficult for any single organization to carry the full workload of a national data base and therefore the cooperative approach has been utilized for GEOSCAN.

However, with the cooperative approach to data base building come several difficulties arising from a decentralized indexing network. GEOSCAN indexers are located in 11 cities and 5 different time zones. Communications among indexers and between indexers and the National GEOSCAN Centre require additional effort on everyone's part. Electronic mail, a GEOSCAN newsletter, telephone communication and annual 5 day indexer's meeting are tools used to overcome communications difficulties. Indexer training is more difficult in a decentralized system and of necessity, training is compressed to several days and becomes very intensive. Comprehensive documentation is very important in a decentralized environment since indexers depend on documentation to provide all of the answers to indexing questions. It is just not possible to "ask the indexer at the next desk" in a decentralized system.

Despite these drawbacks, we believe the benefits of the cooperative approach to data base building outweigh the difficulties. The greatest benefit of this approach is that we have produced a single standardized national data base instead of a number of smaller and widely varying regional data bases.

Role of the National GEOSCAN Centre

The primary role of the National GEOSCAN Centre is to act as indexing network coordinator and data base administrator. A staff of four people perform the following activities:

a) Coordinate the indexing activities of the participating agencies by providing comprehensive system documentation, administering the data base structure, resolving indexing disputes, maintaining the quality and commonality of GEOSCAN indexing and training new indexers
b) Provide and support a computer "home" for GEOSCAN and provide assistance to participating agencies in their use of the computer system
c) Develop and support mechanisms for communication among participants in GEOSCAN at the indexing and management levels
d) Provide guidance and assistance to participating agencies in the production of their information products from GEOSCAN
e) Coordinate public access to GEOSCAN and promote GEOSCAN products and services
f) Plan for future developments in GEOSCAN

Management and financial support

The Geological Survey of Canada (GSC) supports the GEOSCAN indexing program by providing funds for a minicomputer, software, system support, and telecommunications usage. As well, the GSC funds the activities of the National GEOSCAN Centre and devotes four people to the program. The participating organizations support GEOSCAN by committing staff to indexing activities and by providing terminals and telecommunications equipment.

The National GEOSCAN Centre is a part of the Geological Information Division and receives management direction from this unit. As well, the GEOSCAN Management Subcommittee (a subcommittee of the National Geological Surveys Committee) provides policy guidance and general direction for the data base. The GEOSCAN Management Subcommittee is composed of management level representatives from the participating organizations, the GSC and National GEOSCAN Centre, and the Subcommittee provides a "management link" between the "operator" and "contributing" organizations.

GEOSCAN coverage

The geographic and subject coverage of GEOSCAN is shown in Table 1. It presently contains over 94 000 bibliographic records and approximately 7 500 new records are added to the data base each year. Over 13 000 records have been indexed at the analytic level while the remainder are monographic citations.

A document must meet the following criteria in order to be indexed and entered into GEOSCAN:

a) the document must deal with a geoscience topic
b) the document must be available to the public for viewing and/or acquisition
c) the document must concern either the Canadian landmass and offshore regions or report the findings of Canadian geoscience research

It is important to note that documents need **not** be published in order to be indexed for GEOSCAN. In fact, 59% (55 278 records) of the references in GEOSCAN were produced from unpublished yet publicly available geoscience documents. Unpublished material indexed for GEOSCAN includes theses (2 252 records), open file reports (3 553 records), internal reports and maps (5 017 records) and mineral assessment reports (44 456 records).

Since mineral assessment reports account for 47% of the records in GEOSCAN, an explanation of this relatively unknown yet potentially useful document type is in order. Mineral assessment reports are submitted by exploration companies, consultants and individuals in order to document their mineral exploration work performed during a specified period of time (usually one year). A mineral assessment report must be submitted to the appropriate provincial or federal government department as a requirement for maintaining the mineral rights to a property under a claim, permit or license. Although they are usually held as confidential for between one and three years, assessment reports provide a detailed description of the geological setting and economic potential for a specific area and can be most useful to both the explorationist and geoscience researcher.

Published documents (39 125 references) account for 41% of the records in GEOSCAN and include the following

Table 1: Summary of GEOSCAN's Subject and Geographic Coverage

1. Comparison of GEOSCAN and GeoRef coverage of Canada (breakdown by province)

	GEOSCAN	GeoRef
NEWFOUNDLAND	7903	3211
NOVA SCOTIA	8350	3276
NEW BRUNSWICK	4260	2191
PRINCE EDWARD ISLAND	240	260
QUEBEC	22058	9619
ONTARIO	20521	14597
MANITOBA	2044	3466
SASKATCHEWAN	7388	4430
ALBERTA	4623	6596
BRITISH COLUMBIA	2762	7913
YUKON TERRITORY	4248	2587
NORTHWEST TERRITORIES	9412	7009
Canada	94403	51997

2. Broad Subject Categories with postings

AREAL GEOLOGY	35289	MARINE	1016
ECONOMIC GEOLOGY	7405	MATHEMATICAL GEOLOGY	462
EDUCATIONAL GEOLOGY	188	METALLIC MINERALS	30369
ENGINEERING GEOLOGY	674	MINERALOGY	2695
ENVIRONMENTAL GEOLOGY	430	MISCELLANEOUS	369
EXTRATERRESTRIAL	40	PALEONTOLOGY	2578
FOSSIL FUELS	3698	PETROLOGY	1162
GENERAL GEOLOGY	381	RADIOACTIVE MINERALS	2439
GEOCHEMISTRY	11775	SEDIMENTOLOGY	1660
GEOCHRONOLOGY	978	SOILS SCIENCE	46
GEOHYDROLOGY	781	STRATIGRAPHY	4909
GEOMORPHOLOGY	354	STRUCTURAL GEOLOGY	13022
GEOPHYSICS	36391	SURFICIAL GEOLOGY	3026
HYDROGEOLOGY	111	TECTONICS	32
INDUSTRIAL MINERALS	8500		

3. Selected Keywords with postings

AGGREGATES	1890	MORAINES	506
ASSAYS	12773	NICKEL	3840
BARITE	1105	PEAT	701
COAL	1997	RADIOMETRIC SURVEYS	4036
COBALT	1619	SILVER	8274
COPPER	15517	STREAM SEDIMENT GEOCHEMISTRY	1844
E M SURVEYS, GROUND	10204	TILLS	921
FOSSIL DISTRIBUTION	1163	TRENCHES	4324
GOLD	11940	URANIUM	5152
LEAD	8771	ZINC	10310
MOLYBDENUM	3838		

document types:

Published Series and Maps	35272 records
Journal Articles and Books	8853 records

GEOSCAN coverage is most comprehensive for government produced and government administered documents. GEOSCAN coverage in the areas of journal literature and conference proceedings is strong for some regions but overall, these document types are more completely covered in GeoRef and Geoarchive. A comparison of the coverage of Canada by these three geoscience data bases is shown below:

GEOSCAN	GeoRef	Geoarchive
94403 records	51997 records	10598 records

Table 1 shows a geographic breakdown of GEOSCAN and GeoRef coverage of Canada. Since GeoRef's strength is in its coverage of journal literature it becomes apparent that GeoRef and GEOSCAN coverage of Canadian geoscience literature are complementary rather than overlapping.

Data base structure

The data base definition for GEOSCAN consists of 81 fields of which 56 fields contain bibliographic data elements. GEOSCAN uses the field structure recommended for bibliographic data elements in the UNISIST *Reference Manual for Machine-Readable Bibliographic Descriptions.* The remaining 25 fields contain geographic or subject data elements.

Geographic access to geoscience documents is extremely important since a considerable amount of the literature is location dependent. On a broad level, indexers assign codes for the provinces, territories and offshore regions covered in the document. As well, fields have been defined to record counties, townships, mining districts and other geopolitical units used throughout the country.

The most detailed and systematic geographic control is provided through use of the National Topographic System (NTS) for Canada. Under this grid system, Canada is divided into numbered primary quadrants, each being 4 degrees latitute by 8 degrees longitude. This primary quadrant is further subdivided into 5 progressively smaller quadrants with the most detailed unit being .125 degrees latitude by .25 degrees longitude. NTS is a well known national grid system and it provides one of the most useful access methods to GEOSCAN records.

Subject access is provided primarily through the following fields: Geological Age, Subject Category, Keyword, Named Descriptor.

Geologic eras and periods are assigned in the Geological Age field. Twenty-nine broad Subject Categories have been defined and indexers assign one or more subject codes to each GEOSCAN record. Table 1 contains a list of Subject Categories along with the postings for each value. Keywords are controlled through a 3 900 term thesaurus and these terms are generally non-systematic in nature. Systematic terminology is assigned to the Named Descriptor field and more than 20 000 unique terms have been used in this field.

GEOSCAN's approach to subject analysis

Since GEOSCAN does not include abstracts, there is increased importance placed on consistent and thorough document analysis. GEOSCAN subject analysis is performed by either a geologist or geological technician. These subject specialists start by quickly scanning the entire document to determine the broad subject categories. Once subject codes have been assigned the entire document is reviewed in more detail in order to assign Keywords and Named Descriptors. The GEOSCAN thesaurus has been subdivided using the broad Subject Categories and indexers use this tool to identify appropriate Keywords. Thus, in this broader-to-narrower approach, the Subject Categories assigned are supported by the more detailed Keywords. Indexers are obligated to use a minimum of one Keyword in support of each Subject Category code assigned.

The depth of indexing is affected by the size of the document and the level at which it has been written. Special attention is given to economic aspects of the document and we consider this to be a strength in our data base. A typical GEOSCAN record is assigned the following subject and geographic data:

2 to 3	Subject Category codes
10 to 12	Keywords and Named Descriptor terms
1 to 2	Geologic Age terms
1 to 2	Province/Region codes
2 to 3	NTS values

This data, when taken in combination with title words, provides good subject and geographic access to the original document.

Updating and quality control procedures

Records can be entered into GEOSCAN either through an online interactive session or a batch procedure. The online method prompts the terminal operator on a field by field basis. At the end of the prompt sequence the operator may make modifications to the record before it is added to the master data base. Using the online entry method, records are immediately available for retrieval purposes. The batch entry method requires that data be formatted in a style identical to the machine storage format of the data base. Records to be entered via the batch method are sent to the National GEOSCAN Centre on magnetic tape and batch loads are processed 5 to 6 times per year.

Updating existing records is done using the modify module. Interactive modifications are performed one at a time and it is possible to "globally" modify larger sets of records using a batch method.

A number of quality control procedures have been developed to identify incomplete and incorrectly indexed records. When records are entered or modified, the data in 16 fields are validated against authority files. This process controls the terminology and eliminates spelling mistakes in these fields since non-validating data is not written to the record. Indexers review records as they are entered into the data base and NGC staff also examine all new records on a monthly basis. A further series of record checks are carried out using "trap" retrievals. Finally, indexing consistency tests are periodically run to evaluate and improve the subject analysis process used by all indexers.

GEOSCAN's computer system

The GEOSCAN data base is maintained using a relational data base management system named MINISIS. This software package was developed by the International Development Research Centre (Canada) to support bibliographic applications and MINISIS is presently used at 103 installations around the world. MINISIS is menu driven and provides modules for data entry, modify, query, data sorting, print, file maintenance and data base creation. The software also provides online thesaurus and authority file capabilities.

The system hardware consists of a HP3000 model 48 minicomputer with 2 megabytes of memory and 940 megabytes of disc storage on three drives. The minicomputer is located in Ottawa and can be accessed by indexers using the Datapac telecommunication network. This configuration can support 22 concurrent interactive sessions and the system is shared with several other departmental library applications. The master data base file is approximately 100 megabytes in size and the entire GEOSCAN application occupies 250 megabytes.

Utilization of GEOSCAN

At present, the primary use of the data base is in the production of bibliographic indexes for participating organizations. In 1984, 33 products were created from GEOSCAN for publication and other forms of distribution and this number is steadily increasing each year. Products are prepared for the participating agencies in a number of different formats including microfiche, laser printed paper output, floppy diskette and magnetic tape.

Access to GEOSCAN for online searching is presently limited to the libraries of the Geological Survey of Canada (Ottawa, Vancouver, Calgary) and to the participating organizations. The public can have a GEOSCAN search performed through a search intermediary who will negotiate the topic and provide a cost estimate for the retrieval. Access to and acquisition of documents identified through a GEOSCAN search is coordinated by the organization that indexed the records.

While several hundred online retrievals are performed in this manner each year, our ultimate goal is to make GEOSCAN publicly available through one or more data base vendors. It is anticipated that GEOSCAN will be available through a vendor in 1986.

Note

This paper was not presented in Yellowknife but was presented at an earlier NOIR seminar (ed).

INFORMATION SERVICES OF THE INLAND WATERS DIRECTORATE OF ENVIRONMENT CANADA — WATDOC, HYDAT AND NAQUADAT

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WATDOC is a scientific and technical information service. We produce a bibliographic database called AQUAREF. AQUAREF is a merged file of the databases previously known to you under the names Canadian Environment (CENV) and Environment (ENV). AQUAREF provides full bibliographic descriptions, keywords, location codes and abstracts to French and English literature pertaining to the environment and more specifically to water related issues in Canada. Subjects covered include: water resources management, water resources studies, surface water, ground water, ice, snow, glaciers, sedimentation, erosion and different aspects of hydrology. Types of documents referenced are: journal articles, research reports, conference papers and proceedings, monographs and individual chapters, annual reports, maps, etc.

The AQUAREF database is available through CAN/OLE (see elsewhere in this volume). It contains approximately 33,000 references prepared by WATDOC since 1980. Reference files prior to 1980 will be made available subsequent to ongoing revision.

Symbols of Canadian Libraries are included in the majority of records with the exception of journal literature. On-line ordering is available on CAN/OLE and Environment Canada's Departmental Library will be the primary supplier for Environment Canada Publications. CISTI (see elsewhere in this volume) will be an alternative supplier since the collection of microfiche and other reports are deposited there. The collection of microfiche includes documents prepared under specific programs such as the Flood Damage Reduction Program.

In addition to on-line searching, WATDOC has an in-house system for the creation of indexes and bibliographies from sub-sets of the AQUAREF database. These products are produced in standard bibliographical formats.

Our coverage of the offshore and northern topics relates mainly to water related documentation, for example: Arctic ocean studies, Beaufort Sea research. The addition of geocodes (latitude/longitude points and ranges) to the on-line references helps users in identifying offshore locations.

Finally, we also reference river basin studies, Federal Environmental Assessment Review Office (or FEARO) publications and baseline studies which were identified through Environment Canada's Baseline Environmental Information Reference system or BEIRS program.

WATDOC urges both individuals and organizations to contribute their reports, studies, and other publications for referencing in the database. WATDOC will reference all releasable published or unpublished material that meets any of the following criteria:

- water resources research supported by Canadian funds,
- federal, provincial, municipal, and joint Canadian-U.S. water planning and management programs;
- water-related issues of direct concern to Canadians, such as sewage treatment in cold climates and oil spill treatment;
- Environment Canada staff publications dealing with water resources in Canada and outside the country.

For more information concerning the AQUAREF database and the WATDOC service, please write or call:

Louise Power, Manager, WATDOC, Inland Waters Directorate, Environment Canada, Ottawa, Ontario
K1A 0E7
(819) 997-2324

In recent months, we have teamed with the Water Resources Branch and Water Quality Branch in order to provide a more comprehensive marketing of the Inland Waters Directorate databases.

I will now present to you the National Hydrometric Data Bank — HYDAT.

Today, as was true in the past, information on water quantities and river sediments is essential for proper water management. A sample of some water management uses are for evaluating current and future water supplies, environmental assessment, for proper design and operation of structures that control and conserve water and for the allocation of water to individuals and industry and between provinces and countries.

To meet this informational need, the Water Resources Branch of Environment Canada, which was established in 1908, has been collecting data at several thousand locations across the country.

The water quantity and sediment data resulting from this national survey are stored in a National Hydrometric Data Bank known as HYDAT. The HYDAT system contains data for over 3,500 active sites and some 3,700 discontinued sites. Of these, some 250 active and 150 discontinued sites are located north of the 60th parallel. The information of the HYDAT system includes descriptive information and geographical coordinates for all sites, dates and period of operation for each site, as well as daily information with respect to streamflow, water level, water temperature, suspended sediment concentration, sediment particle size and sediment load.

At present, the information on the HYDAT system is available free on request and is provided as photocopies, microfiche, computer tapes and printed publications. These publications are produced regularly and are as follows: Surface Water Data Reference Index; Annual Surface Water Data; Historical Streamflow Summary; Historical Water Level Summary; Sediment Data Reference Index; Sediment Data for Canadian Rivers and Historical Sediment Data Summary.

If you have any questions regarding HYDAT or Water Resources Branch activities please write to the Director, Water Resources Branch, Inland Waters Directorate, Environment Canada, Ottawa, Ontario K1A 0E7.

And now that last data bank: NAQUADAT.

The acronym NAQUADAT stands for National Water Quality Data and it refers to both the computerized data bank of water quality information administered by the Water Quality Branch and to the collection of programs used to store, retrieve and manipulate these data. The NAQUADAT system contains description and geographical coordinates for all sampling locations, dates and project codes for each sample, and parameter codes and analytical measurements for every analysis.

NAQUADAT operates with the System 2000 database management system. The system provides a full range of interactive queries and application programs. The "JOBSUB" utility offers a simple method of requesting data reports by means of an interactive session of prompts and menu-driven choices. NAQUADAT is based on a control data corporation Cyber 730 installation at the EMR Computer Science Centre in Ottawa, from which the database may be accessed via the Datapac network.

NAQUADAT contains results of field and laboratory analyses from 8,500 sampling locations across Canada. The water types include rivers, lakes, ground water, precipitation and wastewater. NAQUADAT stores chemical, physical, bacteriological and hydrometric data. Among the parameters measured are major ions, nutrients, trace metals and organic contaminants. In total, there are over 1,500 different parameters, which are listed in the NAQUADAT dictionary.

On a regular basis, the Water Quality branch collects samples in the Northwest Territories, Yukon and Northern Quebec, from rivers flowing into the Hudson Bay and the Arctic Ocean. There is no regular activity in the offshore islands except for a few estuary and ocean sampling sites. However, the water classification does allow for storage of chemical results from oceans and harbours.

For more information concerning NAQUADAT or Water Quality Branch activities please contact the author.

Note

This paper was not presented in Yellowknife but was presented at an earlier NOIR seminar (ed).

INFOPALL

Claire Koven

Pallister Resource Management Ltd., #105, 4116 - 64th Ave. S.E.
Calgary, Alberta, Canada T2C 2B3 (403) 236-2344

Pallister Resource Management's history dates back to 1958 when it was a geophysical consulting company specializing in oil and gas exploration in the Canadian arctic and offshore frontiers. Some of the earliest arctic reconnaissance surveys were carried out by the then A.E. Pallister Consultants Ltd. in the late '50s and through the '60s.

From this arctic exposure, the company expanded its horizons to include broader functions which we call "Resource Management". Within our consulting work we advise clients in industry, government and university on research, environmental, social and regulatory aspects of northern and offshore matters. In addition to our consulting work, we operate the InfoPall Report Service. It is this service with which I would like to familiarize you here. But first, a few remarks about the resource management database.

With a particular interest in Arctic and offshore petroleum technology, we progressively assembled government-published and industry-released reports for a reference library. During the course of performing consulting work over the past quarter century, we have acquired over 4000 reference documents. Most of these are in the "public domain" having been released by government agencies, university institutes, professional societies, industry associations and private companies. This library, possibly one of the most extensive private collections on Canadian frontier resource management, has been available for use by our clients.

Having experienced some difficulty in even identifying much less acquiring existing data, and knowing that others face the same problem, fifteen years ago we decided to initiate a "Report Service" which would identify material, acquire distribution rights, catalogue acquisitions and publicize their availability. This specialized service was launched on the basis that, although a great deal of literature on the Canadian Arctic and offshore is published in professional journals, summarized in trade magazines and abstracted in bibliographies, there is a large volume of full text that does not reach the people who could and should use it, and with time becomes increasingly difficult to obtain. This condition has existed because of the normal proprietary nature of industry data, restricted public acquaintance with and inventory of government reports, and the lack of any system to retain this type of information in the public domain continuously.

In the mid 1970's, the Arctic Petroleum Operators' Association authorized us to distribute its reports, after a five-year confidentiality period. Today, almost two hundred APOA studies, undertaken at a cost of some $60 million, are available at nominal cost. Similar arrangements have been made with twenty other industry organizations, professional societies, individual companies and government agencies. The result is that a very broad coverage of Arctic and offshore technology and related environmental and socio-economic subjects is not only in the public domain, but is readily accessible in hardcopy and microfiche. There are over one thousand individual reports in the twenty-two series in the InfoPall catalogues. The initial acquisition cost of these data was over one hundred million dollars.

Another example is the relationship with a government agency — the Environmental Studies Revolving Funds (ESRF). InfoPall participates with ESRF in the printing costs of the reports of their studies and distributes them publicly. Under this arrangement, ESRF is assured that public access is served through a managed inventory, the existence of the information is known, and they enjoy a cost-recovery free of an ongoing administration burden. Since there is no confidentiality period on ESRF reports, the information is current. There are now eighty studies completed or underway, with an acquisition cost of some $7 million.

In order that these "hard-to-get" materials are known to a wide range of researchers and planners, we have established working relationships with information centers in government and universities under which we, or the owners of the reports, contribute microfiche of reports to their collections for indexing in their bibliographies. In this way, their existence can be identified by online searches. (The reports are also indexed in an in-house computer system). A co-operative program among the Arctic Petroleum Operators' Association (APOA), the University of Calgary's Arctic Institute of North America (AINA), and InfoPall has resulted in two hundred APOA reports and twenty-five ESRF reports being integrated within AINA's Arctic Science and Technology Information System (ASTIS).

InfoPall's charges for these reports are based on their reproduction cost together with a share of the overall costs of managing the inventory and services. The price of an average one-hundred and fifty page hard copy report is forty dollars, and twelve dollars in microfiche form.

There are three levels, in increasing detail, of descriptive material available at no cost to those interested in acquainting themselves with InfoPall reports.

1. A list of catalogues and price lists of the twenty-two report series are widely distributed.
2. Catalogues listing the reports and News Release announcements describing the contents of report additions are issued to parties requesting to be on our mailing list.

3. A Subject Index listing, under thirty-six subject headings, is provided periodically to our four hundred regular customers.

Having become a participant in the network of Canadian arctic and offshore data, we are once again expanding our horizons. We are beginning to participate in other North American systems and have opened an office in California to obtain more U.S., particularly Alaskan and West Coast data. InfoPall continues to search out additional material to add to this database and specialized service, and we solicit your assistance in adding material for which you would like to have greater distribution and use.

In summary, our goal is to contribute to the development of a cooperative and coordinated — but decentralized —data system among the numerous organizations in Canada, the United States and other countries that have an interest in northern and offshore information. We see the present situation as one of great strength in the individual organizations, but with a need for improvements in two respects:

— In order to maintain the quality of systems at a time of rapidly increasing volumes of data concurrent with limitations of funding availability, there is a need for new mechanisms to affect increased cooperation among and within industry, government and university. NOIR is making an important contribution in the meeting of this need.

— Although systems of indexing and archiving are well-established and becoming increasingly efficient through electronic apparatus, the systems for the identification and acquisition of current and special information or "grey literature" and its delivery to the user do not appear to have advanced to the same extent. We believe the InfoPall report service is filling at least a part of this need.

I will be interested in hearing your comments on these two perceived weaknesses, and how we might participate with you in working towards improvements.

For further information contact the author or:

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Report Service Administrator,
InfoPall, Telex: 03-821172
#105, 4116 - 64th Avenue S.E.,
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AQUATIC SCIENCES AND FISHERIES ABSTRACTS (ASFA) DATABASE AND COMPACT DISC-READ ONLY MEMORY (CD-ROM)

Jonathan R.L. Sears
Cambridge Scientific Abstracts, 5161 River Road, Bethesda, MD 20816 U.S.A. (301) 951-1408

Introduction

The Aquatic Sciences and Fisheries Abstracts (ASFA) database is an international information service for the science, technology and management of marine, brackish and freshwater environments and organisms. A product of the Aquatic Sciences and Fisheries Information System (ASFIS), sponsored by the Food and Agriculture Organization of the United Nations (FAO), the Intergovernmental Oceanographic Commission (IOC) of Unesco, and the Ocean Economics and Technology Branch of the United Nations Department of International Economic and Social Affairs (UN/OETB), with the collaboration of participating ASFIS centres in twelve countries, the database is available through online vendors throughout the world, and in printed form as the monthly publications: ASFA-1: Biological Sciences and Living Resources, and ASFA-2: Ocean Technology, Policy and Non-living Resources, published by Cambridge Scientific Abstracts. The database contains approximately 300,000 records from 1975, with monthly updates of about 3,000 abstracts. All types of documents are included, and coverage is international, with over 40 languages to date. About 70% of the records are journal articles, 20% are conference papers, 5% are technical reports, the remainder being monographs, theses/dissertations, and non-conventional literature. The broad breakdown by discipline is in the following proportions:

ASFA-1

Biology	31.94%
Ecology	28.28%
Fisheries/Aquaculture	19.32%
Pollution	14.49%
Physical environment	2.73%
General aspects	2.73%
Law, Policy, Socio-economics	0.50%

ASFA-2

Oceanography, Limnology, Meteorology	33.41%
Technology/Engineering	20.35%
Geology, Geophysics, Geochemistry	18.62%
Pollution	11.14%
Resources	7.35%
General aspects	5.44%
Law, Policy, Socio-economics	3.69%

Northern and offshore information in ASFA

The Arctic, the North American offshore, and northern aquatic environments are well covered in the ASFA database, in all the major fields listed above. As one would expect, the majority of these will be on biology, ecology, resources, oceanography, limnology, meteorology, geology, and pollution. However, legal, sociological and policy aspects are also found. Much work has been done on the exploration and exploitation of oil in the north, and the impact this may have on the environment. The adverse impact of acid precipitation on northern ecosystems is also a major environmental issue having international policy ramifications. Baseline environmental studies and basic biological research are important foundations of such studies. Satellite sensing of Arctic, northern and offshore regions has provided a wealth of data on these remote and often inhospitable areas, and the literature generated from these programs is quite extensive. In addition to the North American literature, there is a quantity of information from north European, Scandinavian, Soviet and Japanese studies on northern latitudes, included in the ASFA database, due in part to the contributions made by input centres in these countries. As one example, the information on the North Sea oil and gas industry is of importance to those engaged in harsh, cold-water engineering research elsewhere in the world.

A quick search was made on ASFA using the following northern regions as descriptors:

Arctic	2722	references		
Canada	8369			
Alaska	2313			
Northwest Territories	277		Nova Scotia	630
Manitoba	313		Labrador	460
Ontario	1398			
Yukon	127			
Newfoundland	830			
PN? (sea code=Arctic)	2539			

Compact disc read-only memory (CD-ROM)

The ASFA database is also produced on compact disc — read only memory (CD-ROM), a new information storage medium which allows up to 550 megabytes of data on a 4¾ inch disc, which can be searched and displayed using an IBM PC, PC-XT, or PC-AT equipped with a compact disc player and the compactCAMBRIDGE software.

Data are stored on the disc in the form of a thin metal layer with pits pressed into it, covered with a plastic coating. The CD-ROM comes in a 4¾-inch format which is the same as the audio CD, and is tracked by a laser optical head, which focuses a very small spot of light on the rotating disc to read the data. Data can take the form of alphanumeric characters, pictures (photographs, diagrams, etc.), sound (speech, music, etc.) or combinations of the above. How much information can be stored on a CD-ROM? At the time of writing, the 550 megabyte disc can store about one hour of music, or 35 hours of voice, or 1,000 pictures at 200 dots per inch (8.5 × 11-inch pages), or 7,000 pictures when compressed by special software, or 550 megabytes of alphanumeric characters, which amounts to about 100 million words. Even greater densities are likely in the future.

The advantages of very high density (between 10-100 times that of a comparable magnetic hard disc, and between 100-1000 times that of a floppy disc), and low cost for reproduction and distribution (although the initial mastering process is expensive, typically $3,000 to $5,000 per disc), make CD-ROM technology very attractive for the distribution of large databases to a large user community. CD-ROM also has the advantage for the user of being a self-contained unit, without the need for telecommunications and online charges. CD-ROM installations are particularly well suited to remote areas where good data connections are unavailable.

The number of CD-ROM products is forecast to grow rapidly, and these will include not only databases, but also consumer products such as Groliers Academic American Encyclopedia, the King James Bible, service manuals and training systems, telephone directories and maps.

CompactCAMBRIDGE/ASFA

The premier ASFA compact disc contains records from the Jan 1982 to Jun 1985 portion of the database, and it is planned to include the full database from Jan 1978 to the present, on future updates, and ultimately to include the 1975-1977 portion as soon as it is available, totalling over 300,000 records dating back over a decade.

Data fields and their codes in compactCAMBRIDGE/ASFA records

a. Indexed (searchable)

1.	[AU]	Author
2.	[AF]	Author affiliation
3.	[CO]	Corporate author
4.	[TI]	Title
5.	[SO]	Source (serial/monograph title and date)
6.	[DE]	Subject descriptors Biological taxonomic descriptors Geographic descriptors Other descriptors, identifiers
7.	[AB]	Abstract
8.	[NM]	New material indicator

b. Displayable but not indexed

9.		Document number (ISSN, ISBN, report number)
10.		Conference date
11.		Publisher
12.		Place of publication
13.		Collation (volume, issue, pagination)

14. Language codes
15. Notes, availability

compactCAMBRIDGE search software

The compactCAMBRIDGE search software has been developed to include two levels of search language. For the novice searcher, there is a menu-prompted system. For the more experienced searcher there is an interactive command-driven ".dot" system. Either level can be used to search by field abbreviations and standard Boolean operators. Help screens are available at any point during a search, and menu/command choices are always displayed at the bottom of the screen. A user manual is available. Some DOS functions can be conducted from the compactCAMBRIDGE menu. Another interesting feature is the recall by a single (CR) of windows to list the options available under a menu choice. For example, at the prompt

FIELD ABBREVIATION?

a (CR) will bring up a window with the complete listing of fields and codes.

The search function has the options of single (uniterm) words, phrases, proximity operators, and both prefix and suffix truncation. To view the dictionary of terms and numbers of postings, the EXPAND command is used which displays the 20 terms around the specified word, and can be scrolled forward and backward 20 terms at a time.

Nested search statements can be used in the .dot with the use of parentheses and Boolean operators.

Set numbers are assigned for each search, for use in displaying or printing of retrieved documents, or for combining previous sets with subsequent searches. At any time, a table showing the previous five sets can be displayed by using the command TABLE on the main menu.

Documents in sets can be displayed and/or printed, beginning with any specified number in the set.

Hardware

compactCAMBRIDGE is currently supported on IBM PC, PC-XT, PC-AT and true compatibles. The current CD-ROM drives which can be used are manufactured by Digital Equipment Corporation, Philips and Hitachi. Future models will include Sony, Denon, Toshiba and Panasonic.

QL SYSTEMS AND THE NORTH

Phillip Brown
Marketing Manager, QL Systems Limited, 2160 Bow Valley Square IV, 250 - 6th Avenue SW
Calgary, Alberta T2P 3H7 (403) 262-6505

QL Systems Limited had its beginnings as a research project at Queen's University in Kingston, Ontario. We commenced commercial operation about 10 years ago, with our head office and computer facilities remaining in Kingston. We now operate over 100 data bases on many topics. We have offices in 6 cities in Canada: Vancouver, Calgary, Toronto, Ottawa, Kingston and Halifax, and we are able to provide demonstrations and training in our data bases at these offices. A list of all offices is provided in the QL/Catalogue of Data Bases and Services.

Searches can be performed for you by QL offices, by university, college and public libraries, and by private research companies. You can also have an account with QL and perform searches with your own computer terminal. Our data bases are available through the Datapac telephone network, which has local numbers in most centres in Canada for such purposes.

The equipment requirement is this: any terminal which can communicate in ASCII at 300 or 1200 b.p.s. through the Datapac telephone network. This includes typewriter terminals as well as CRT's, personal computers, and most word processors.

The search charges are based on straight connect time and for most data bases are as follows (in 1986): $75.00 per hour in prime time (7 a.m. to 7 p.m. local time, Monday to Friday), and $30.00 per hour evenings and weekends. These rates include the cost of the call from your nearest Datapac centre. There is no charge to acquire an account with QL, and no minimum usage or monthly fee. A mini-manual is provided free to all new users and to all registrants at QL workshops. An extensive 2-part manual is available for $75.00. This manual provides descriptions of all data bases, as well as detailed explanations of all search commands.

The QL data bases that are of particular interest for Northern and Offshore Research are:

SCIENTIFIC:

Arctic Science and Technology
QL/Environment
Boreal Northern Titles
Mining Technology
Mineral Processing

NEWS:

Canadian Press NEWSTEX
Business Information Wire
Canada News-Wire
Canadian Business Index and Canadian News Index

GOVERNMENT AND LEGAL:

Federal Hansard, Oral and Written Questions
Federal and Provincial Statutes and Regulations
Court and Board decisions

QL/Environment is a new environmental information service on QL. It will include some of our existing environmental data bases such as those provided by WATDOC (see elsewhere in this volume), as well as material being gathered from new sources. The search rate for this new service is $20.00 per connect hour, including data communications. By making this reduction in search charges we hope to encourage increased research on environmental issues.

QL would be interested in operating other databases on the North or the offshore, and welcomes requests from organizations who are gathering such information in-house and want it to be made more widely accessible.

We attend many conferences during the year as exhibitors and will consider all suggestions for participation in such events. As well, we offer training workshops in major centres throughout the year.

AN INTRODUCTION TO THE HOCHELAGA RESEARCH INSTITUTE/ INSTITUT DE RECHERCHE HOCHELAGA

Alan Cooke, *Director*
1200 Atwater Avenue, Montreal H3Z 1X4 (514) 937-8074

Hochelaga is a non-profit organization incorporated under federal charter to create a polar research library in Montreal. Its name commemorates the European discovery of the island of Montreal. In October 1535, just over 450 years ago, Jacques Cartier visited Hochelaga, an Indian village on the south slope of a wooded hill he named *Mont réal*, the royal mountain. During Cartier's brief visit, he realized that, at the rapids just up river from the island, he had reached the end of ocean-going navigation. We may date the beginning of sustained communication between the Old World and the New in these latitudes from that moment. Confrontations between the traditional societies of the New World and European culture and technology have created many problems that are clearly seen today in the northern parts of North America, problems that persist wherever traditional peoples survive and in much of the Third World.

To incorporate a non-profit organization in Canada, three persons are required. My fellow incorporators are Mme Johan Sarrazin and Dr. Paul Wilkinson, both of Montreal. Mme Sarrazin is an editor and consultant who specializes in northern publications and problems. Dr. Wilkinson, an authority on the domestication of musk-oxen, is also a consultant on northern problems. We had worked together as consultants for the Naskapi Indians of Schefferville during the negotiations that led to their signing the Northeastern Quebec Agreement, an addition to the James Bay and Northern Quebec Agreement, in 1979.

I have been associated with polar research libraries since I was an undergraduate at Dartmouth College, Class of 1955. In 1959, I returned to Dartmouth to become assistant librarian in the Stefansson Collection, Dartmouth College Library. In 1963, I began graduate study in historical geography at the Scott Polar Research Institute, University of Cambridge. I supported myself there with a bibliographical research contract from the Centre d'études nordiques, Université Laval. In 1965, I moved to Université Laval, Québec, to finish *Bibliographie de la péninsule du Québec-Labrador* (Boston, G.K. Hall, 1968, 2 vols). In 1967, I returned to Cambridge to finish my thesis on the Hudson's Bay Company's activities in the Quebec-Labrador peninsula during the mid-19th century. On my return, the Scott Polar Research Institute appointed me assistant librarian and curator of manuscripts. In 1972, I became, as well, editor of the institute's journal, *Polar Record*.

In 1975, I returned to Canada to earn my living as freelance editor and consultant. Among the works I have edited since then are *Alaska Highway Pipeline Inquiry* by Kenneth Lysyk and others (Ottawa, Supply and Services, 1977); *Canadian Nordicity: It's your north, too* by Louis-Edmond Hamelin, translated by William Barr (Montreal, Harvest House, 1979); *Fragile freedoms: human rights and dissent in Canada* by Thomas R. Berger (Toronto, Clarke, Irwin, 1981); *Inuit Land Use and Occupancy Project report* by Milton Freeman and others (Ottawa, Indian and Northern Affairs, 1976); *Learning: tradition and change in the Northwest Territories* by the Special Committee on Education, Legislative Assembly of the Northwest Territories (Yellowknife, 1982); *The Living Arctic* by Fritz Muller (Toronto, Methuen, 1981); *Maps and dreams: Indians and the British Columbia frontier* by Hugh Brody (Vancouver, Douglas & McIntyre, 1981); *Northern frontier, northern homeland: the report of the Mackenzie Valley Pipeline Inquiry* by Mr. Justice T.R. Berger (Ottawa, Supply and Services, 1977); *Our footprints are everywhere: Inuit land use and occupancy in Labrador* by Carol Brice-Bennett and others ([Ottawa], Labrador Inuit Association, 1977); *The People's land: Eskimos and Whites in the Eastern Arctic* by Hugh Brody (Harmondsworth, Eng., Penguin, 1975), and *Village journey: the report of the Alaska Native Review Commission* by Thomas R. Berger (New York, Hill and Wang, 1985). In 1978, The Arctic History Press, Toronto, published *The Exploration of northern Canada, 500 to 1920, a chronology* by Alan Cooke and Clive Holland.

In 1977, McGill University's Centre for Northern Studies and Research employed me to supervise the creation of a Northern Studies Library to replace the library of the Arctic Institute of North America, which had left the McGill campus earlier that year for new quarters in Calgary. In 1983, McGill University suppressed the Northern Studies Library for reasons with which I could not agree. Later that year, with Mme Sarrazin and Dr. Wilkinson, I incorporated to begin over again the work I had been doing at McGill.

It is, in my opinion, shocking that a nation of Canada's wealth and northward dimensions does not have full control of the circumpolar literature. After 13 years in the Scott Polar Research Institute, as well as experience in the Stefansson Collection and the Centre d'études nordiques, I believe I understand what there is to be said about the organization of polar information. Unlike most scholars, I have had a long and varied experience of employment in research libraries; unlike most librarians, I have had a scholar's interest in the documents in my care.

For Hochelaga, I have clear ideas for the creation of a new kind of computerized bibliographical data base: we shall recatalogue the circumpolar literature with an attention to detail no library has previously attempted and from a Canadian point of view. We are seeking clients who may wish to have the literature of interest to them collected, catalogued, and cross-referenced in new detail. Through contracts of this kind, we shall add to our data base and to our library. At the end of a contract, we shall be able to offer not only a comprehensive, annotated, indexed bibliography of a particular subject or region but also, in consultation with the client, some form of commentary based on the literature just surveyed, such as an historical and regional introduction to a particular problem, a state-of-the-art review of a particular subject, a compilation and analysis of statistics or facts from many sources, a listing of options among which decisions of policy might be made, etc.

In March 1985, Hochelaga rented space in Atwater Library, downtown Montreal. During the past year, my colleagues, Jennifer Cram and Stefan Cooke, have worked on bibliographical research contracts that have enhanced our library. The Inuit Literature Project for the Eastern Arctic Teacher Education Program, Frobisher Bay, involved the collection and cataloguing of a library of materials in Inuktitut and in any language by Inuit authors. Ms Cram delivered this library to Frobisher Bay in January 1986. In March 1986, we sent to the Department of Education, Government of the Northwest Territories, an annotated bibliography on northern and Native education. We prepared at short notice for the Naskapi Band Council of Schefferville a bibliography of renewable resources in the central interior of the Quebec-Labrador peninsula, and I have in hand a number of editorial contracts. We hope to begin publication of a journal during the coming year.

We welcome inquiries of any kind related to the collection and organization of polar literature or to the preparation of polar information or other material for publication.

Note

Alan Cooke was unable to attend NOIRS ACUNS meetings in Yellowknife. He did attend the NOIR Seminar in Ottawa (ed).

THE UNIVERSITIES OF CANADA AND THE NORTH — A GUIDE

THE UNIVERSITIES OF CANADA AND THE NORTH — A GUIDE

Although this section will be of use to scholars, students and others in "the South", in Canada and abroad, it is specifically designed to be of use to residents of the North. It contains profiles of ACUNS' member universities, especially prepared for this volume.

Each of the 35 member universities of ACUNS was asked to respond to the questionnaire which follows this introduction. The universities were asked to stress not only 'Northern Studies' but also aspects of their institutions which might be of particular interest to people living in the North (e.g. Distance Education programs even if they only operate in the South). We are grateful to the ACUNS Council Members and to the University Presidents who assisted with the project.

Individual universities responded to the questionnaire in different ways. Responses have been edited so that each profile can be read independently. The reader is however encouraged to scan the questionnaire which provides a rationale for the sorts of information which the universities chose to provide.

In the profiles you will find a great deal of information on Distance Education, Native Studies, Credit Transfer, Coop. Programs, and university teaching in the North as well as information on "Northern Studies". All of these topics receive attention elsewhere in this volume. Further information on northern research and teaching in Canadian universities can be obtained from ACUNS' *List of Northern Specialists at Canadian Universities/Liste des spécialistes du nord dans les universités canadiennes* (ACUNS Occasional Publication/Publication occasionnelle, No. 8, 1983). This publication will be updated shortly. Further information on the universities of Canada in general can be obtained from such publications as *Directory of Canadian Universities/Répertoire des universités canadiennes*, published by the Association of Universities and Colleges of Canada (151 Slater Street, Ottawa, Canada K1P 5N1, telephone 613-563-1236). Information included here can generally be regarded as current for 1986.

The member universities of ACUNS and their representatives on its Council are given below. Generally the profiles in this section were submitted by Council members. Full addresses and 'phone numbers are given in the individual profiles. The asterisks indicate universities for which profiles are not available. These include a number of major 'northern' universities, for example Carleton (e.g. Northern and Native Studies Program), and York.

University of Alberta	A.S.A. Mohsen
Athabasca University	Donald Kvill
Brandon University	William R. Morrison
University of British Columbia	John K. Stager
University of Calgary	Mike Robinson
*Carleton University	Stanley R. Mealing
Concordia University	Ron Mackay
Dalhousie University	Robert M. Moore
École Polytechnique	Branko Ladanyi
University of Guelph	Jackie S. Wolfe
Lakehead University	Geoffrey R. Weller
Laurentian University	Frank F. Mallory
Université Laval	Serge Payette
University of Manitoba	Wm. Koolage
McGill University	Marianne Stenbaek
McMaster University	Wayne Rouse
Memorial University	Carol Brice-Bennett
Université de Montréal	Marie Lessard
University of New Brunswick	Ian R. Methven
University of Ottawa	James C. Fenwick
Université du Québec à Chicoutimi	Jules Dufour
*Université du Québec à Montréal	Jean Morisset
Université du Québec à Trois-Rivières	Paul Laurin
Université du Québec en Abitibi-Témiscamingue	Rémy Trudel
Queen's University	Robert Gilbert
University of Regina	James B. Carefoot
Ryerson Polytechnical Institute	Frank Duerden
University of Saskatchewan	James F. Basinger
Simon Fraser University	Colin Crampton
University of Toronto	Thomas C. Hutchinson
Trent University	Frederick M. Helleiner
University of Waterloo	Robert F. Keith
University of Western Ontario	Roger H. King
University of Windsor	John D. Jacobs
*York University	Duncan Cameron

One of the problems which the people of the Territories, and non Canadians, have in dealing with universities in Canada is the fact that there is no Canadian university system. Each province has its own system of education so that at the university level there are at least eleven systems (if one regards the military colleges as federal universities). This is a problem (from many points of view, of course, it is a strength) which is not confined to Northern Studies. While ACUNS acts as a national focus for Northern Studies in universities in Canada (see article by Marc-

Adélard Tremblay, in this volume), a key national focus for the university 'system' as a whole is the Association of Universities and Colleges of Canada (AUCC). The Executive Director of the AUCC gave an address at ACUNS' Yellowknife meetings which forms the basis of the article which leads off this Section. The article is designed to introduce northerners and others to the universities of Canada.

QUESTIONNAIRE UPON WHICH PROFILES IN THIS SECTION ARE BASED

1. Name, full address, general telephone number of university.
2. Number of full-time undergraduates, part-time undergraduates, full-time graduate students, part-time graduate students.
3. Major faculties and professional schools.
4. *Organization of northern studies* (indicate if staff are specifically assigned), with address and phone number of key person or organization. Please give a brief description and history of northern studies at your university, *mentioning special emphases.*
5. Brief statement on *principal organizational features* of northern studies at your university, e.g. separate library , special collections, archives, field stations, chairs, degree programs. See below re Native Studies.
6. *Selected northern courses* (indicate if undergraduate or graduate). Please list an illustrative selection of your offerings using a parenthetic description where the title is not self-explanatory. Use your own judgement as to what is "northern". Feel free to add catch-all statements such as "Various courses in x, y or z also have a substantial northern content".
7. *Teaching in the North,* field courses, northern extension courses, distance education (indicate number of students resident in the North), use of Churchill Northern Studies Centre or other facilities by your faculty and students. (Here again the idea is to project the nature of the activity at your university rather than to provide an exhaustive listing.)
8. *Distance Education — general.* If your university has "distance education" programs (e.g. T.V., cassette, correspondence courses) or expertise which, although not directly involving the North, might be of interest to northern educators, please give summary details and a point of contact.
9. *Coop programs and special credit arrangements.* Again try to imagine the sort of things that a northern educator or student might be interested in for use with respect to your university or as a model. Transfer of credit between college and university, for example, is of great interest to current northern students. So is the value of work experience for credit.

Renseignements à fournir:

1. Nom, adresse complète et n° de téléphone général de votre Université.
2. Nombre d'étudiants de premier cycle à plein temps et à temps partiel, et d'étudiants des 2^e et 3^e cycles à plein temps et à temps partiel.
3. Principales facultés et écoles spécialisées.
4. *Organisation des études nordiques* (précisez si des professeurs y sont explicitement affectés) et nom, adresse et n° de téléphone d'une personne ou d'un organisme qui en est cheville ouvrière. Faites une courte description et le bref historique des études nordiques dans votre Université, en indiquant *les domaines auxquels elle accorde un intérêt particulier.*
5. Bref exposé des *principaux organes* au service des études nordiques dans votre Université, p. ex.: bibliothèque séparée, collections spécialisées, fonds d'archives, stations de terrain, chaires particulières, programmes d'études supérieures. Voyez ci-dessous à "Études autochtones".
6. *Choix de cours nordiques* (précisez à quel cycle). Veuillez indiquer un choix de cours à titre d'exemple, en précisant leur contenu entre parenthèses si leur nom n'est pas suffisamment descriptif. Veuillez décider vous-même si tel ou tel cours est "nordique" et ajoutez, si vous le jugez bon, une indication générale telle que "Divers cours x, y ou z ont également un contenu nordique considérable".
7. *Enseignement dans le Nord canadien,* cours sur le terrain, enseignement para-universitaire nordique, enseignement à distance (indiquez le nombre de Nord-Canadiens qui y sont inscrits), utilisation du Centre d'études nordiques de Churchill et d'autres installations par le corps enseignant et les étudiants de votre Université. (Ici encore, il s'agit de décrire la nature des activités plutôt que de fournir une liste exhaustive.)
8. *Caractéristiques générales de l'enseignement à distance.* Si votre Université offre des programmes d'enseignement à distance (p. ex.: télé-enseignement, cassettes, cours par correspondance) ou dispose d'un potentiel technique qui, même s'il ne concerne pas directement le Nord, pourrait intéresser les responsables de l'enseignement nordique, veuillez

10. *Northern Research.* Cite key projects and emphases including where appropriate, regional focusses. Try to give an indication of the scale of research concerned. Do you maintain a field station in the North? Mention involvement of northerners in your projects where appropriate and cooperation with northern organizations. Give an indication of the level of involvement of your university in the DINA Northern Scientific Training Program. Mention northern conferences which you have organized in recent years or which you have planned, especially those which characterize research at your university.

11. a) Using the attached excerpt from the ACUNS *List of Northern Specialists,* list northern scholars at your university using *one line* for each as follows: Name, department, specialization, northern region. (For specialization you might use the categories in the List).

    b) List selected references for your university, particularly those which provide an entrée to your various areas of research.

12. *Native Studies.* Give a brief indication of the scale and nature of Native Studies at your institution whether northern work is involved or not.

donner quelques détails ainsi que le nom d'une personne bien informée.

9. *Programmes de cours en alternance et transférabilité des crédits de cours.* Imaginez-vous une fois encore dans la situation d'un responsable pédagogique ou d'un étudiant s'intéressant aux avantages de votre Université. La transférabilité des crédits de cours entre collège technique et université est, par exemple, de grand intérêt actuel pour les étudiants du Nord. Il en est de même des crédits accordés en contre-partie de l'expérience pratique.

10. *La recherche nordique.* Veuillez citer des programmes-pivots et des domaines préférentiels de votre Université y compris, s'il en est, ses pôles d'intérêt régionaux. Efforcez-vous de donner une idée de l'ampleur des travaux de recherche. Votre Université dispose-t-elle d'une station expérimentale dans le Nord? Indiquez l'ampleur de la participation des Nord-Canadiens à la réalisation des projets, si cela convient, et de la collaboration de l'Université avec les organismes nordiques. Comment participe-t-elle à la mise en oeuvre du Programme de formation scientifique dans le Nord, administré par le Ministère des Affaires indiennes et du Nord? Mentionnez les conférences nordiques organisées par votre Université au cours de ces dernières années, ou celles qui sont prévues, en particulier si elles concernent directement les recherches accomplies par votre établissement.

11. a)En utilisant l'extrait ci-joint de la *Liste des spécialistes du Nord,* donnez la liste des chercheurs ainsi spécialisés de votre Université, en consacrant *une ligne* à chacun pour indiquer son nom, son département, sa spécialisation et la région nordique à laquelle il ou elle s'intéresse. (En ce qui concerne la spécialisation, vous pourriez utiliser les diverses catégories de la *Liste*.)

    b) Donnez un choix de références bibliographiques relatives à votre Université, particulièrement celles qui mettent en évidence ses principaux axes de recherches.

12. *Études autochtones.* Veuillez donner quelques renseignements sur l'envergure et la nature des études autochtones dans votre Université, que des recherches nordiques y soient accomplies ou non.

CANADA'S UNIVERSITIES IN CONTEXT: AUCC AND THE "UNIVERSITY SYSTEM"

Allan K. Gillmore and Mark Giberson
Association of Universities and Colleges of Canada
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Few Canadians need to be reminded of their proximity to the north. The thick mantle of snow that blankets most of the country up to six months of the year is reminder enough.

But it is equally fair to say that for the majority of Canada's 25 million inhabitants, living in the cities and towns of the south, the north is little more than a curiosity — a cold and forbidding part of the Canadian mosaic whose place in confederation is still largely undefined and whose significance is still largely unrealized.

From time to time, important events thrust the north into the forefront of the public imagination. The hearings into the proposed Mackenzie Valley Pipeline in the late 1970s are an example. A more recent one occurred in August 1985 when the U.S. Coast Guard vessel Polar Sea navigated the Northwest Passage without the benefit of Canadian permission, thereby calling into question Canada's claim to the waters in and around the arctic archipelago.

Events such as these are infrequent. Meanwhile, information about on-going northern concerns remains at a premium in the mass media outlets of the south. But in the country's academic community the situation is changing.

Since 1977 a consortium of Canadian universities — the Association of Canadian Universities for Northern Studies — has sought to develop a better understanding of the north through scholarship, research and professional and scientific training. More than 30 universities hold membership in the association and all, in one way or another, have northern interests.

The sections that follow describe the programs of each institution in detail. But first, to assist readers in Canada's North and those abroad in understanding the jurisdictional context in which universities in Canada must operate, a look at Canadian universities in general —their history and development and their place in the Canadian polity.

The Canadian social contract is a study in anomalies. On the one hand, Canadians have traditionally favored a strong central government — one that would safeguard minority rights against the tyranny of the majority, ensure orderly progress and promote equality of opportunity. On the other hand, the Canadian confederation provides for a high degree of provincial autonomy, particularly in matters relating to cultural and social policy.

Collectively, universities in Canada find themselves somewhere in the middle of this jurisdictional tug-of-war. As well, their governing bodies reflect interests that are both public and private, religious and secular, English and French. It is not surprising, therefore, that one has difficulty talking about a Canadian university system.

Notwithstanding the lack of a national system of higher education, Canadian universities share a number of similarities and one of these is that, with few exceptions, they rely heavily on public support. Federal tax and cash transfers to the provinces nominally in support of postsecondary education account for a major portion of university operating income. But despite Ottawa's crucial role in postsecondary educational support, no department of the federal government is specifically empowered to oversee the development of the country's institutions of higher education.

The reasons for this are, to a large extent, historical. The federation agreement that gave birth to Canada in 1867 assigned responsibility for education to the provinces. At that time, government involvement of any kind in institutions of higher learning was minimal. Canada's embryonic universities, with few exceptions, were religious institutions. That situation began to change in the early years of this century when the governments of Canada's four western provinces — Manitoba, Saskatchewan, Alberta and British Columbia — began setting up provincially chartered universities in much the same way that landgrant colleges were established in the United States.

Ottawa's involvement in postsecondary educational support took on increasing importance after the cessation of hostilities following World War II when it enlisted the universities' cooperation in providing education and training benefits to returning veterans. The universities complied by initiating new programs and allowing their enrolments to grow in order to accommodate the increased demand.

But really spectacular growth did not occur until the late 1950s and early 1960s. In the seven years between 1955 and 1962, full-time university enrolment doubled. It doubled again between 1962 and 1969. Part-time enrolment, too, underwent phenomenal growth as more and more students elected to further their studies at the graduate level. To keep pace with the educational needs of the so called "baby-boomers", 19 new universities were granted provincial charters.

University enrolments continued to grow through the 1970s and early 1980s, albeit at a somewhat slower rate. Preliminary enrolment figures for 1985-1986 show 408,560 full-time and 242,800 part-time students at the undergraduate level with another 56,150 full-time and 34,380 part-time students at the graduate level.

In 1984-1985, provincial government operating grants accounted for 61.9 per cent of total university income.

DIAGRAM: HIGHER EDUCATION FRAMEWORK
DIAGRAMME: CADRE DE L'ENSEIGNEMENT SUPERIEUR

JURISDICTION COMPETENCE	GOVERNMENT DEPARTMENTS MINISTERES GOUV.	OTHER GOVERNMENT AGENCIES AUTRES ORGANISMES GOUV.	UNIVERSITY COLLECTIVITY COLLECTIVITE UNIVERS.
Federal Fédérale	Secretary of State Secrétariat d'Etat MOSST MEST Department of Finance Ministère des Finances	NSERC CRSNG SSHRC CRSH MRC CRM NRC CNR Stats Can	Association of Universities and Colleges of Canada Association des Universités et Collèges du Canada
National Nationale	Council of Ministers of Education, Canada Conseil des ministres de l'Education (Canada)		
NFLD TN	Department of Career Development and Advanced Studies		Association of Atlantic Universities Association des universités de l'Atlantique
PEI IPE	Dept. of Education Council of Maritime Premiers Conseil des premiers ministres des Maritimes	Maritime Provinces Higher Education Commission Commission de l'enseignement supérieur des provinces Maritimes	
NS NE	Dept. of Education		
NB	Dept. of Advanced Education and Train.		
QUE	Min. de l'Enseignement supérieur et de la Science	Conseil des universités	CREPUQ[1]
ONT	Ministry of Colleges and Universities	Ontario Council on University Affairs Conseil ontarien des affaires universitaires	Council of Ontario Universities Conseil des universités de l'Ontario
MAN	Department of Education	Manitoba Universities Grants Commission	Council of Western Canadian University Presidents Conseil des recteurs d'université de l'Ouest canadien
SASK	Department of Advanced Education and Manpower		
ALTA	Department of Advanced Education		
BC CB	Ministry of Postsecondary Education	Universities Council of British Columbia	

[1] Conférence des recteurs et des principaux des universités du Québec Conference of rectors and principals of Quebec universities.

The federal government continued to contribute indirectly to those grants by transfering cash and tax points to the provinces. In 1985, an estimated $4.5 billion in unconditional federal transfers went to the provinces for postsecondary educational support under the Federal Postsecondary Education and Health Contributions Act, known earlier as the Established Programs Financing Act. The contributions take the form of a cash payment from the Department of the Secretary of State and a tax transfer from the Department of Finance.

Direct federal grants, mainly in support of university-based research, accounted for another 9.2 per cent of total income. Tuition fees made up another 11 per cent and the remaining 16 per cent was derived from donations, the sale of university services and investment income.

Recent experiences with double digit inflation and shifting government priorities have put the universities under tremendous pressure to rationalize their program offerings and, in some cases, eliminate whole departments. Pleas for adequate and stable funding sources have been deflected by both levels of government as each blames the other for the universities' financial woes.

The diversity of Canadian postsecondary institutions, the variations among provinces and the complex jurisdictional questions surrounding postsecondary educational funding make it impossible to generalize about university-government relations. The chart illustrates the main features of those relationships, but it cannot describe their complexity or the important differences one finds between provinces or regions.

For example, the Council of Ontario Universities, made up of the province's university chief executives and academic colleagues, has extensive dealings with the provincial grants commission — the Ontario Council on University Affairs — and with the provincial and federal governments. Its activities are supported by a permanent secretariat that includes a well developed research component. A similar situation is found in Quebec with the Conférence des recteurs et des principaux des universités du Québec.

The Council of Western Canadian University Presidents, a regional body, appears, on the surface, at least, to have a similar mandate to its eastern counterparts. However, since each of the four western provinces sets its own policies vis-à-vis higher education, university-government relations are undertaken at the provincial level. The council's principal functions are to provide a forum for the exchange of ideas and information among western university presidents and to represent the interests of western universities to the national government — when they have a common position. The council has no permanent staff.

In Atlantic Canada, the picture is different still. Here, the Association of Atlantic Universities, also a regional body, makes representations to a regional grants commission —the Maritime Provinces Higher Education Commission — that oversees higher education policy for three of the four Atlantic provinces. Memorial University of Newfoundland, while a member of the regional association, deals directly with the Newfoundland department of career development and advanced studies.

Since 1911, the university community has been represented at the national and international levels by the Association of Universities and Colleges of Canada (AUCC). The organization was incorporated by an Act of Parliament in 1965 "to foster and promote the interests of higher education in Canada". To realize its mandate, the association coordinates nation-wide initiatives undertaken by its member institutions and maintains a variety of centrally administered services. It represents the concerns of the university community to the Government of Canada, the Council of Ministers of Education, Canada, to the general public and at national and international fora. It facilitates the study and discussion of issues in higher education and the exchange of ideas and information among its members. It also acts as a clearing house for information on higher education in Canada.

During its formative years, the association was primarily concerned with academic matters. But beginning in 1939, it also turned its attention to government relations and the need for increased public support. It spearheaded a movement to alert Canadians to the growing demand for university education and was successful in obtaining a commitment of public monies to develop the country's higher education and research capabilities. In 1957 and for a decade to follow, the federal government called on the association to determine the eligibility of institutions to receive federal grants and to distribute those funds on its behalf.

Also in 1957, a permanent secretariat was established in Ottawa. A grant from the Carnegie Corporation of New York the following year led to the addition of a library and research and information services to the central office. Today the secretariat carries out a wide range of activities on behalf of the association's membership, related organizations and the public at large.

Seventy-nine institutions hold ordinary or full membership in the association by having met academic, administrative and financial standards set out in the association's by-laws. Another three institutions are provisional members.

An eleven-member board of directors serves as the executive arm of the association. Its composition reflects the importance attached to regional interests — the chairs of the regional/provincial university associations noted above are ex officio members as are four other directors elected by the association's membership from the four regions.

In the absence of any formal accrediting body either nationally or provincially, membership in the AUCC provides Canadian universities with the type of recognition, both at home and abroad, that one normally associates with accreditation.

The association also provides its members with a communications network consisting of numerous specialty and general interest publications. These include the monthly newsmagazine *University Affairs*, the fortnightly newsletter *Notes from AUCC*, the biennial *Directory of Canadian Universities*, the annual *Compendium of University Statistics* and various limited circulation newsletters that focus on such topics as collective bargaining, government relations and international development.

The secretariat facilitates linkage agreements with educational institutions in the developed and developing world and administers a host of foreign government, corporate and Canadian government scholarship programs.

Other services are provided by the AUCC's associate member organizations. These groups, numbering more than 30 in 1986, represent major academic or administrative divisions or special interests within the Canadian university community. The Association of Canadian Universities for Northern Studies is expected to join the AUCC as an associate member later this year.

The AUCC is just one of three voices speaking on behalf of higher education at the national level. The Canadian Association of University Teachers and the Canadian Federation of Students represent two other important university constituencies that have organized themselves into nation-wide bodies, each mandated to provide services to their members while bringing their unique perspective to the government decision-making process.

For those outside the Canadian university community and, perhaps even for members of that community, the multiplicity of associations, advisory bodies, decision-makers and special interest groups that have grown up around the Canadian academy may present a bewildering and incomprehensible confusion. For those who have experienced this kaleidoscope of interests working at its best, that perception is no more accurate than are the popular misconceptions about Canada's north.

Note

This article was developed from the presentation which Dr. Gillmore made at the ACUNS meetings in Yellowknife (ed).

UNIVERSITY OF ALBERTA
EDMONTON, ALBERTA

Since its founding in 1908, the University of Alberta has maintained a strong interest in northern Canada and much of the teaching and research through the years has had a northern focus. Until recently, Canada's most northern University campus and still the most northern "conventional" campus, this University has consistently attracted northern scholars and students. Thus today it is foremost among western Canadian Universities of interest to those who wish to study or research the North.

Over the period of 77 years, the University of Alberta has seen dramatic growth. It currently houses 18 faculties; is affiliated with six colleges; is associated with several institutions/agencies; and supports more than 16 research centres and institutes.

Final enrollment figures for the 1985/86 session are not as yet available. Those for 1984/85 were: —

Number of full-time undergraduates	20,404
Number of part-time undergraduates	3, 285
Number of full-time graduate students	2,504
Number of part-time graduate students	1,069

These figures include many students from the N.W.T. and Yukon including students of native ancestry.

Due to its location and long history of interest in the north, it is difficult to summarize everything of interest to a student of northern studies or to a researcher seeking northern information and expertise. The list (Table 1) gives an indication of the numbers of staff and varied disciplines covered by northern specialists at this University. In addition a large number of graduate students pursue northern topics towards Masters or Doctoral degrees some of whom are also listed.

It is hoped that this guide will serve as a starting point from which to access the wealth of northern expertise and information at the University of Alberta and which merely introduces the scope of northern studies at the University of Alberta. Further information can be obtained by consulting the current University Calendar or by contacting a faculty directly.

The general address and phone number is:

The University of Alberta
Edmonton, Alberta
T6G 2E1
Phone no. 403-432-3111

Admission requirements and special student services

Admission Requirements

Full information regarding eligibility for admission to the University of Alberta is in each year's University Calendar. In addition, some faculties have more specific admission requirements as well as a limit to the number of students that may enrol in a given year. Up to 85% of the places in quota faculties are normally reserved for Alberta residents. A resident of Alberta is defined as a Canadian citizen or permanent resident (landed immigrant) who has been domiciled in Alberta or Yukon or the Northwest Territories for at least one continuous year immediately prior to the date of intended registration at the University. There are also special admission arrangements which may apply to non-matriculated (mature) students who are over 21 years of age and, in some faculties (e.g. Law), to Native applicants.

Since English is the primary language of instruction, except in Faculté Saint-Jean, applicants must possess an adequate knowledge of written and spoken English as a prerequisite to admission. Regardless of country of origin or of citizenship status, applicants will be required to demonstrate proficiency in the English language which may be by one of several ways outlined in the calendar.

Student Services

In order to help students there are several student services available. These include a Dean of Student Affairs, health services, an international student centre, student counselling services, assistance for disabled students and an Office of Native Student Affairs.

The *Office of Native Student Affairs* serves both the University and the wider community. First, it is a student service which is complementary to counselling, remediation and other general student services within the University. The office provides an orientation for new students and is a primary resource for the Native Student Organization, which maintains a meeting room and a study room connected to the office. As the administrator of the Native Student Development fund, the office reviews applications for bursaries and emergency loans, and awards bursaries and prizes based on academic achievement. The office assists Native students in all aspects of university life.

Second, the office provides information about Native issues within the University. A third focus of activity is making the University's information and academic services available to the Native population of Alberta and the North.

Enquiries are welcome. Contact:

Office of Native Student Affairs
124 Athabasca Hall
The University of Alberta,
Edmonton, Alberta
T6G 2E8
Phone: 403-432-5677

Boreal Institute for Northern Studies

The main centre for northern studies at the University of Alberta is the Boreal Institute for Northern Studies. Founded in 1960, it has as its prime objective the gathering and dissemination of information about the North in order to increase understanding and awareness of that part of Canada.

The principal function of the Institute is to initiate and encourage northern research and to publish the results. This is facilitated by a program of research grants to graduate students and others and by undertaking direct research under contract or grant funding. Research grants to graduate students and others are managed under two programs: DINA Northern Science Training Grants and the Boreal Alberta Research Fund. By the 1985 field season, $604,600 had been distributed under the DINA Northern Science Training Grants Program in support of approximately 350 projects, and over $1,000,000 had been distributed through the Boreal Alberta Research Fund to individuals for over 400 research grants. In addition, throughout the years, many contract and grant research projects have been undertaken. The two most recent and still ongoing programs are 1) the follow-up study of perinatal and infant mortality and morbidity in the N.W.T., and 2) the epidemiology and control of viral hepatitis B in northern Canada.

Complete information regarding the research grant programs can be obtained from the Institute's Research Grants Officer.

The Institute maintains a multi-disciplinary library, which is a distinct and separate collection from the University's main library. The collection covers the circumpolar world with major emphasis on the Canadian arctic, Alaska, and the mid-Canada corridor. Materials collected cover all subjects, including fiction, and range from the highly scientific to general interest and children's reading level. The library subscribes to newspapers and newsletters from communities north of 60 degrees, Native publications of Canada, and all periodicals concerning northern regions. These serials are indexed by the library's publication *Northern Titles KWIC Index* which is also available for online searching through QL Systems. The Library also maintains a database of its card catalogue which can be searched either on the University of Alberta computer or through the national on-line system CAN/OLE (see Information Systems section of this volume).

Since its inception in 1971, the Library has been an active participant in the *Northern Libraries Colloquy*, an international group of northern librarians and others concerned with northern information services. This group now meets biannually alternately in North American and Europe. On behalf of the group, the Library recently completed and published the second edition of *Polar and Cold Regions Library Resources: a directory*.

Complete information regarding library services can be obtained from the Institute's Librarian.

The Institute is also engaged in a program of exchanges with other northern institutes in Scandinavia, Japan and China.

Conference activity at the Boreal Institute includes support, organization and participation. Since its inception, the Institute has participated in the *National Northern Development Conferences* held every three years in Edmonton. In November 1984, the Institute initiated the *Northern Research Workshop* series at which current or former grantees of the Boreal Institute presented papers or gave poster sessions on the findings of their Institute-supported research.

Current northern staff specialists include: A.S.A. Mohsen, M.M.F. Freeman, R.S. Jamieson, G.A. Cooke, R.L. Minion, B. Schweger, L. Carbyn, K. Martin, E. Bielawski, L. Lange.

Further details of the Institute's activities and programs can be obtained from:

The Boreal Institute for Northern Studies,
CW401 Biological Sciences Building,
The University of Alberta,
Edmonton, Alberta,
T6G 2E9

Phone: 403-432-4999

Faculties

There are 18 faculties at the University of Alberta. Most faculties offer courses which focus specifically on some aspect of the North, including the circumpolar world, or offer courses which have some relevance to northern concerns. The faculties of perhaps greatest interest to a student of northern studies are Arts, Education, Engineering, Medicine and Science. These are listed first, followed by the other faculties listed in alphabetical order.

1. Faculty of Arts

General Office phone no: 403-432-4295

Departments and sample courses are:

Anthropology — Peoples and cultures of circumpolar regions
— Dene society in anthropological perspective
— Cree language and culture
Art and Design
Classics
Comparative Literature
Drama
East Asian Languages and Literature
Economics
English
Germanic Languages — Norwegian
History — The Canadian North
— Topics in Canadian Native history
Music
Philosophy
Political Science — Politics of the Canadian North
Psychology
Religious Studies — Shamanism
Romance Languages
Slavic and East European Studies
Sociology — Theories of ethnic minority relations

The faculty also offers a **Canadian Studies Program** which includes a course — Canadian North: human dimension. It is hoped to integrate a Northern Studies program with the Canadian Studies Program which offers the student the opportunity to examine all aspects of Canadian living.

Northern staff specialists include:

Anthropology
M.I. Asch
O.B. Beattie
A.L. Bryan
A.B. Fisher
M.M.R. Freeman
C.G. Hickey
H.T. Lewis
C.E. Schweger
D.E. Young

Germanic Languages
C. Hale

History
O.P. Dickason
C.S. MacKinnon

Sociology
J.W. Gartrell
C.W. Hobart

Political Science
G. Dacks

Others
M.V. Dimic
S.E. Drugge
M.L. McMillan
R.A.J. Pendergast
M.B. Percy
T.S. Veeman
R.E. Jones
I.S. MacLaren
J.C. Stott
D. Kuiken
T.M. Nelson
E.H. Waugh

2. Faculty of Education

General office phone no. 403-432-3751

Departments and sample courses are:
Educational Administration
Educational Foundations
- Education of Native Peoples in Canada
- Contemporary issues in the education of Native Peoples

Education Psychology
Elementary Education
Secondary Education
Industrial and Vocational Education

Northern staff specialists include: E.J. Ingram, M.J. Assheton-Smith, E. Callan, R. Carney, C.A. Urion and M.P. Browne.

This faculty trains many teachers who eventually take positions in the N.W.T. and Yukon. There is an *Undergraduate Intercultural Education Program* which specifically prepares the student for teaching in intercultural situations. This program is offered by the Department of Educational Foundations. Further information and program counselling may be obtained from the Intercultural Education Advisor — Joan Scott-Brown, Room 5-104.1, Faculty of Education Building, Phone: 403-432-3726.

The Department of Educational Administration offers an *Extended Campus Master of Education Program* which makes it possible for students to meet their residency requirements for a Master's Degree in Educational Administration in an off-campus location. As of 1985, the program is offered in selected communities in northern Alberta. There is the possibility the program will be extended to other parts of northern Canada. For further information contact The Coordinator, E.J. Ingram, 403-432-3691.

3. Faculty of Engineering

General office phone no. 403-432-3320

Departments and sample courses are:
Chemical Engineering
Civil Engineering
- Ice engineering for inland waters
- Coastal engineering in cold regions

Electrical Engineering
Mechanical Engineering
- Energy conservation
- Environmental factors in mechanical engineering design

Mining, Metallurgical and Petroleum Engineering

This faculty has many specialists in cold regions engineering, liaises with C-FER and sponsors a series of conferences.

Northern staff specialists include:

Civil Engineering
R. Gerard
T.M. Hrudey
P.M. Huck
P.K. Kaiser
J.G. MacGregor
N.R. Morgenstern
D.C. Sego
D.W. Smith
S. Thomson

Mechanical Engineering
K.C. Cheng
J.D. Dale
T.W. Forest
E.M. Gates
G.W. Sadler
D.J. Wilson

Conferences sponsored by the Faculty on a continuing basis include:

A. Department of Civil Engineering:
a) Cold Regions Engineering Conference — cosponsored with the Technical Council for Cold Regions Engineering of the American Society of Civil Engineers and the Canadian Society of Civil Engineers.

b) Utilities Delivery in Cold Regions Conference —cosponsored with the University of Alaska and the Environment Protection Service, Environment Canada. Conference is held every three years.

c) Cold Regions Environmental Engineering Conference — cosponsored with the University of Alaska and held every three years.

B. Department of Mechanical Engineering:
The International Symposium on Cold Regions Heat Transfer is scheduled for June 4-6, 1987. Contact Dr. K.C. Cheng.

4. Faculty of Medicine

General Office phone no.: 403-432-6621

Departments and divisions:
Anaesthesia
Anatomy
Applied Sciences in Medicine
Biochemistry
Family Medicine
Health Services Administration and Community Medicine
Immunology & MRC Group on Immunoregulation
Medical Microbiology
Medicine Internal and Clinical Medicine —
General Internal Medicine, Cardiology, Dermatology, Endocrinology, Gastroenterology, Clinical Hematology, Immunology and Nephrology, Infectious Diseases, Neurology, Medical Oncology, Pulmonary Medicine, Rheumatology
Obstetrics and Gynaecology
Ophthalmology

Pediatrics —
  Infectious Diseases, Medical Genetics, Neonatology, Paediatric Cardiology, Hematology/Oncology
Pathology —
  Electron Microscopy, Forensic, Occupational and Environmental Pathology, Neuropathology, Clinical Pathology and Medical Laboratory Science
Pharmacology
Physiology
Radiology and Diagnostic Imaging —
  Nuclear Medicine, Radiation Oncology
Surgery and Clinical Surgery —
  General Surgery, Experimental Surgery, Neurosurgery, Orthopaedic Surgery, Otolaryngology, Plastic Surgery, Thoracic and Cardiovascular Surgery, Urological Surgery, Neurophysiology, Surgical Biochemistry

Northern staff specialists include: R.A. Amy, J.C. Godel, R.P.B. Larke, H.F. Pabst, G.W. Scott, D.W. Spady

Through an affiliation with Medical Services (Northern Region) of the Department of National Health and Welfare, a regular rotation of clinical faculty and residents to Inuvik and the arctic coastal areas is maintained. This **Mackenzie Area Ambulatory Program** covers Cambridge Bay and the surrounding settlements of Gjoa Haven, Spence Bay, Pelly Bay, Coppermine and Holman Island.

The Department of Ophthalmology maintains a program of six visits annually to Inuvik General Hospital under the terms of an agreement between The University of Alberta and the Ministry of National Health and Welfare. Coordinated by Dr. W.G. Pearce, an ophthalmologist makes visits at about two-month intervals to provide patient care to people of the N.W.T.. On four or five of the visits, the consultant is accompanied by a resident in the second year of the four-year training program leading to the Royal College of Physicians and Surgeons of Canada certification in Ophthalmology. These trips are considered a valuable part of the resident's education.

5. Faculty of Science

General office phone no.: 403-432-1254

Departments and sample courses are:
Botany — Plant Ecology
Computing Science
Genetics
Geography — Frontier Settlement
  — Northern Lands
  — Boreal Ecology and Northern Development
  — Periglacial Geomorphology
Geology — Canadian Shield and Arctic
  — Glacial and Periglacial Geology
Linguistics
Mathematics
Microbiology
Physics
Psychology
Statistics and Applied Probability
Zoology — Boreal Ecology

The Department of Geography offers a B.Sc. degree with specialization in Northern Frontier Studies. Full details of the program are in the University calendar.

Northern staff specialists include:

Botany
M.R.T. Dale
K.E. Denford
M. Hickman
J. Hoddinott
G.H. La Roi
J.G. Packer
R.A. Stockey
D. Vitt

Physics
M.E. Evans
J. Gray
G. Rostocker
J.C. Samson

Geography
J.H. England
R.G. Ironside
G.P. Kershaw
R.B. Rains
W.C. Wonders

Zoology
S.J. Hannon
W.C. Mackay
E.E. Prepas
W.M. Samuel
I. Stirling
C. Strobeck
W.M. Tonn
A. Trimbee

Geology
J. Brigham-Grette
R.A.M. Burwash
B.D.E. Chatterton
P. Erdmer
F.J. Hein
B. Jones
R. Morton
B.E. Nesbitt
S.G. Pemberton
N.W. Rutter
D.G.W. Smith

Other
H.I. Freedman
T.deF. Rogers
T. Yamamoto

Research Stations:
The Department of Botany maintains a research station at Hondo, Alberta and the Department of Zoology maintains a limnological research station at Meanook, near Athabasca, Alberta.

The Arctic Workshop:
Dr. John England, of the Department of Geography, is one of the original participants in this workshop which is held annually at the Institute for Arctic and Alpine Research, Colorado. The focus is on Quaternary research in a variety of disciplines and in recent years has become international in scope.

6. Faculty of Agriculture and Forestry

General office phone no.: 403-432-4931

Departments: Agricultural Engineering, Animal Science, Entomology, Food Science, Forest Science, Plant Science, Rural Economy, Soil Science

Most courses are not specifically focussed on the North, but the majority have applicability, depending on the special interests of the student.

Northern staff specialists include: J.J.R. Feddes, R.J. Hudson, G.E. Ball, A. Craig, A.K. Hellum, P.J. Murphy and A.W. Bailey.

7. Faculty of Business

General office phone no.: 403-432-5693

Departments: Accounting, Finance and Management Science, Marketing and Economic Analysis, Organizational Analysis.

8. Faculty of Dentistry

General office phone no.: 403-432-3117

Departments: Dental Health Care, Restorative Dentistry, Stomatology, Oral Biology.

9. Faculty of Home Economics

General office phone no.: 403-432-3824

Departments: Clothing and Textiles, Family Studies, Foods and Nutrition.

Northern staff specialists include: N. Kerr, A. Lambert, B. Schweger.

10. Faculty of Law

General office phone no.: 403-432-3115

Those who obtain a law degree at the University of Alberta can article anywhere in Canada, except Quebec.

11. Faculty of Library Science

General office phone no.: 403-432-4140

Several research projects have had implications for northern libraries.

12. Faculty of Nursing

General office phone no.: 403-432-6236

The faculty has been contracted by the federal government to deliver *continuing nursing education workshops* to registered nurses in Inuvik and Whitehorse. The nurses identify the topic areas and Professor Patricia Hayes contracts with appropriate experts to conduct the workshops at mutually convenient times. Typical workshop topics include: medi-evac of critical patients, update in obstetrical care, care of psychiatric patients and communications. Total annual attendance is approximately 200.

Northern staff specialists include: P. Hayes.

13. Faculty of Pharmacy and Pharmaceutical Sciences

General office phone no: 403-432-3362

Sections include: Division of Continuing Pharmacy Education, Slowpoke Nuclear Reactor.

14. Faculty of Physical Education and Recreation

General office phone no.: 403-432-3364

Departments: Physical Education and Sport Studies, Recreation and Leisure Studies, Athletic Services.

Northern staff specialists include: H.A. Scott, A.S.A. Mohsen, M. Singh.

15. Faculty of Rehabilitation Medicine

General office phone no.: 403-432-5949

Departments: Occupational Therapy, Physical Therapy, Speech Pathology and Audiology.

16. Faculté Saint-Jean

General office phone no.: 403-468-1254

Initially founded as Collège Saint-Jean in 1908, it became Collège Universitaire Saint-Jean, an integral part and bilingual sector of the University of Alberta, in 1970. Official faculty status was granted in September 1977 and the name changed to Faculté Saint-Jean in May 1978. The goals of the Faculté are, first, as the bilingual faculty, to allow students of French background to pursue their University studies in French, and, second, to allow students of English background to benefit by this environment. The Faculté is located approximately 6km east of the University of Alberta campus to which it is connected by a free mini-bus service.

Services include library facilities, centre de documentation pédagogique, continuing education centre, student counselling and student residences (also a French day care centre).

17. Faculty of Graduate Studies and Research

General office phone no.: 403-432-3499

Two basic categories of graduate degree programs are offered: doctoral and master's. The Faculty also offers postgraduate diploma programs designed to provide an opportunity for individuals to take a sequence of courses to increase their knowledge in a specialized area. The specific programs offered in each category are:

Doctoral degrees: Education(Ed.D.); Music(D.Mus.); Philosophy(Ph.D.)

Master's degrees: Agriculture(M.Ag.); Arts(M.A.); Business Administration(M.B.A.); Education(M.Ed.); Engineering(M.Eng.); Fine Arts(M.F.A.); Health Services Administration(M.H.S.A.); Laws(LL.M.); Library Science(M.L.S.); Music(M.Mus.); Nursing(M.N.); Pharmacy(M.Pharm.); Public Management(M.P.M.); Science (M.Sc.); Visual Arts(M.V.A.)

Post-graduate diplomas: Educational Administration, English, Exploration Geology, Health Services Administration, Law.

18. Faculty of Extension

General office phone no.: 403-432-3116

The Faculty of Extension serves as a link between the University and its storehouse of information and expertise for people who need access to this information and these skills in order to solve practical problems and to further personal growth and personal interests. To this end, the Faculty offers courses, seminars and materials in various forms and the provision of books, films, tapes and educational media equipment. Faculty members are also involved in consulting, training, and research in adult education. Many non-credit programs are offered, including the following which are presently offered in N.W.T.:

Management Development Program which is designed for managers with two or three years experience and who have reached at least the lower-middle echelons of their companies or organizations.

Supervisory Development Program which is designed to provide background information techniques in management areas where supervisors are constantly being tested, such as the areas of planning, organizing, controlling, setting performance standards, communicating, motivating and applying decision-making techniques.

Schools, research centres and institutes

There are over 17 research centres and institutes at the

University of Alberta. The most important concerning the North is the Boreal Institute for Northern Studies. Two others of major interest are:

School of Native Studies

The University recently established the School of Native Studies which is in the process of hiring a Director and organizing programs. Many courses which deal with Native Peoples and their languages are already offered by various departments. It is expected that the School will have a Director by the fall of 1986, who will also teach an introductory course in Native Studies, and that there will be a teacher of Cree giving two courses in that language.

In the meantime, enquiries should be directed to: Dr. Tom Pocklington, Acting Director. Phone: 403-432-2991

Centre for Frontier Engineering Research (C-FER)

This centre formally began operation on January 1, 1984 with a mandate to research problems related to material, fabrication, design, regulations, transportation and construction of structures required for arctic and offshore development. The intent is to provide a focal point for the research and development necessary to promote and enhance Canadian engineering and industrial participation in those areas.

The centre has a strong affiliation with the University and is located on-campus.

For further information contact: Liz Clarke, Information Officer. Phone: 403-432-5108.

Affiliated Colleges

On-campus Colleges

There are two denominationally-sponsored colleges with buildings located on campus which are related to the University by affiliation agreements. These colleges offer a number of courses that may be taken for credit by students of the University. They are:

a) St. Stephen's College — a graduate theological school of the United Church of Canada. General office phone no.: 403-439-7311

b) St Joseph's College — under the authority of the Roman Catholic Church. General office phone no.: 403-433-4461

Off-campus Colleges

Four private colleges are related to the University of Alberta by affiliation agreements under which certain courses offered by the colleges will be accepted for credit towards a University degree. These colleges are:

Camrose Lutheran College, Camrose, Alberta
Canadian Union College, College Heights, Alberta
Concordia Lutheran College, Edmonton, Alberta
Kings College, Edmonton, Alberta.

Formal affiliation agreements no longer exist between the University and other public colleges in Alberta. However, provision has been made for the transfer of students from these to other post-secondary educational institutions in Alberta.

Table I
A partial list of staff specialists and graduate students engaged in northern studies at the University of Alberta

Staff	*Department*	*Project*
Amy, Dr. Roger A.	Pathology	Pathological study of remains from the last Franklin expedition
Asch, Dr. Michael I.	Anthropology	Dene Mapping Project. Dene economic development
Baadsgaard, Dr. Halfdan	Geology	Geochronological study of the carbonatite near Big Spruce Lake, N.W.T.
Bailey, Dr. Arthur W.	Plant Science	Prescribed burning and grazing systems
Bain, Dr. Bruce C.	Educational Psychology	Semilingualism and education in the North
Ball, Dr. George E.	Entomology	Ground beetles (Family Carabidae) of the western arctic and Beringia
Beattie, Dr. Owen B.	Anthropology	Paleopathology, concentrating on the Franklin Expedition Beechey Island site and a whaling station site on Baffin Island in the Pangnirtung region
Blowers, Dr. Elizabeth A.	Educational Psychology	"Child of tundra — child of bush" Monograph on teaching isolated children
Boag, Dr. David A.	Zoology	Gyrfalcon foraging strategies studies in the central arctic. Peregrine falcon reproductive and toxicology studies at Rankin Inlet
Brigham-Grette, Dr. Julie	Geology	Quaternary stratigraphy and geochronology of the Canadian Beaufort Sea and adjacent areas
Bryan, Dr. Alan L.	Anthropology	Excavation and analysis of early prehistoric site near Moose Lake, NE Alberta
Burwash, Dr. Ronald A.M.	Geology	Uranium and thorium in crystalline rocks of the Western Shield

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Carbyn, Dr. Lu N.	Boreal Institute	Wolf study program
Carney, Dr. Robert	Educational Foundations	Northern (N.W.T.) curriculum, Northern teacher education
Charlton, Dr. Robert B.	Geography	Fog, cloud, and snow from petrochemical industries during very cold weather
Chatterton, Dr. Brian D.	Geology	Projects involving conodonts, trilobites and paleozoic stratigraphy
Cheng, Dr. Kwo Chang	Mechanical Engineering	Cold regions heat transfer
Cooke, Geraldine A.	Boreal Institute	Yukon Bibliography Update series Northern Titles KWIC Index
Cox-Bishop, Dr. M	Clothing and Textiles	Cross-cultural study of sex differences found in drawings by Canadian Inuit and American children
Dacks, Dr. Gurston	Political Science	Costs and benefits of division of N.W.T.
Dale, Dr. James D.	Mechanical Engineering	Low temperature starting of diesel fuels
Dale, Dr. Mark R.T.	Botany	Competition in lichen communities
Denford, Dr. Keith E.	Botany	Chemical differentiation of northern endemic plant species and their disjunct relatives. Complete taxonomic study of the species Arnica
Dickason, Dr. Olive P.	History	Rise of Amerindian autonomous movements
Dimic, Milan V.	Comparative Literature	The vampire as double in Scandinavian folklore
Dranchuk, Peter M.	Mineral Engineering	Behaviour of oil and gas wells in the Arctic Islands and the Beaufort Sea
England, Dr. John H.	Geography	Late Quaternary glaciations, sea level fluctuations, and climatic change on northern Ellesmere Island
Erdmer, Dr. Phillippe	Geology	Geological, structural and metamorphic analysis of continental collision rocks in central Yukon
Evans, Dr. Michael E.	Physics	Paleomagnetism of the Earth's magnetic field
Fisher, Dr. Anthony B.	Anthropology/ Educational Foundations	Alcohol abuse — social and biological implications for Canadian native people
Freedman, Dr. Herbert I.	Mathematics	Statistical analysis of predator-prey systems. Modelling of migrating northern animals
Freeman, Dr. Milton M.R.	Anthropology/ Boreal Institute	North Alaskan bowhead whaling. Traditional ecological knowledge of northern societies
Gartrell, Dr. John W.	Sociology	Community health studies on Alberta Indian reserves. Energy resource communities in Alberta
Gerard, Dr. Robert	Civil Engineering	River ice studies
Godel, Dr. John C.	Pediatrics	Northern infant nutrition. Influenza vaccine program
Green, Dr. Leslie C.	Political Science	Aboriginal peoples, international law and the Charter
Hale, Dr. Christopher	Germanic Languages	Place names in Norway and Iceland. Danish/Norwegian literature
Hannon, Dr. Susan J.	Zoology	Causes of cyclic fluctuations in willow ptarmigan populations
Hayes, Patricia	Nursing	Delivery of continuing education workshops to graduate nurses
Hellum, Dr. Andreas K.	Forest Science	Seed ripening and dormancy in northern and high latitude populations of lodgepole pine
Hickey, Dr. Clifford G.	Anthropology	Arctic cultural ecology and ethnohistory. Relationships of people to their environment over time
Hickman, Dr. Michael	Botany	Distribution of epipelic diatoms in the Yukon. Paleolimnology of two Yukon lakes
Hobart, Dr. Charles W.	Sociology	Employment of Native Peoples in northern resource development

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Holmes, Dr. John Carl	Zoology	Community ecology of parasites of waterfowl
Hrudey, Dr. Steven E.	Civil Engineering	Evaluation of greywater treatment alternatives for isolated northern communities
Huck, Dr. Peter M.	Civil Engineering	Treatment of wastewaters from uranium mines
Hudson, Dr. Robert J.	Animal Science	Ecology of caribou on Coat's Island, Hudson Bay
Ingram, Dr. E.J.	Educational Administration	Outreach education for educational administrators
Ironside, Dr. Robert G.	Geography	Quality of life in frontier settlements
Jamieson, Robert S.	Boreal Institute	Coordinator of viral hepatitis B and PIMMS studies
Jarvis, Dr. George K.	Sociology	Social pathology and alcohol consumption in Yukon communities
Jones, Dr. Brian	Geology	Biostratigraphy of the southern arctic islands. Devonian stratigraphy of the Hay River — Fort Simpson area
Kaiser, Dr. Peter K.	Civil Engineering	Field investigations of rock avalanches
Kershaw, Dr. G. Peter	Geography	Environmental effects of disturbances in the subarctic. Oil spill reclamation
Kinney, Ronald W.	Extension	Training programme design for economic development of Yukon Indians. Delivery model design for self-directed continuing education in isolated areas
La Roi, Dr. George H.	Botany	Snowpack/meteorological/vegetation relationships of the Hondo — Lesser Slave Lake area
Lambert, Anne	Home Economics	Cold weather clothing
Lange, Dr. Linda	Boreal Institute	Employment of native women at the Norman Wells project. Research interests of N.W.T. native groups
Larke, Dr. R.P. Bryce	Pediatrics	Epidemiology and control of hepatitis B in northern Canada
Lewis, Dr. Henry T.	Anthropolgy	Native use of fire
MacGregor, Dr. James G.	Civil Engineering	Design of ice resisting walls for off-shore oil exploration and production structures
Mackay, Dr. William C.	Zoology	Effect of latitude on growth rate and reproduction of northern pike
MacKinnon, Dr. C. Stuart	History	Keewatin 1893-1963
MacLaren, Dr. I.S.	English	The British Navy's presence in the nineteenth century arctic
Martin, Dr. Kathy	Boreal Institute	Parental care and reproductive potential of willow ptarmigan
McCormack, Dr. P.	Canadian Studies Program	Fort Chipewyan bicentennial 1988 project. Hunting and trapping technology
McMillan, Dr. Melville L.	Economics	Assessment of tax initiatives for the N.W.T. government. Property taxation of northern pipelines
Minion, Robin L.	Boreal Institute	BINS bibliographic series Management of the database BOREAL
Mohsen, Dr. A. Sami A.	Boreal Institute/ Recreation and Leisure Studies	Comparative work and leisure behaviour
Moore, Dr. Charles H.	Romance Languages	Inuit art exhibitions. Retrospective of drawings and prints of Pitseolak and Mamngusualuk. Rebirth of legend at Baker Lake
Morgenstern, Dr. Norbert R.	Civil Engineering	All aspects of permafrost engineering
Morton, Dr. Roger David	Geology	Silver deposits of the Great Bear Lake area
Murphy, Peter J.	Forest Science	Forest fire behaviour, history and policy
Nelson, Dr. Thomas M.	Psychology	Influence of artificial light and indoor climate on human comfort and performance
Nesbitt, Dr. Bruce E.	Geology	Geochemistry of Yukon lead-zinc-silver deposits

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A partial list of staff specialists and graduate students engaged in northern studies at the University of Alberta

Pabst, Dr. Henry F.	Pediatrics	Northern infant nutrition. BCG vaccine: immune response and effectiveness
Pendergast, Dr. Russell A.J.	Economics	Transportation and natural resource conservation
Percy, Dr. Michael B.	Economics	
Prepas, Dr. Ellie E.	Zoology	Prediction and manipulation of productivity in eutrophic lakes
Rains, Dr. R. Bruce	Geography	Quarternary geomorphology of northern Saskatchewan
Reinelt, Dr. Ernest	Geography/ Earth and Planetary Physics	The arctic inversion movement of ice in the Beaufort Sea. Remote sensing of the high arctic by means of meteorological satellites
Renecker, Lyle	Animal Science	Techniques for estimating intake in free-ranging ungulates. Resource use behaviour of moose in the aspen boreal forest
Rogers, Dr. Thomas de F.	Mathematics	Nonlinear models of population dynamics
Rostocker, Dr. Gordon	Physics	Aurora borealis studies
Rutter, Dr. Nathaniel W.	Geology	Amino acid dating of wood, molluscs in northern Canada from Quaternary deposits
Sadler, Dr. Gerald W.	Mechanical Engineering	Thermal conductivity of insulating materials at below zero temperatures
Samson, Dr. John C.	Physics	Pi2 micropulsations and the prediction of localized intensifications of polar magnetic substorms at Fort Smith, N.W.T.
Samuel, Dr. William M.	Zoology	Impact of the winter tick on moose populations
Schweger, Barbara	Boreal Institute	19th century arctic expedition clothing. Historic Scandinavian cold weather clothing design and usage
Schweger, Dr. Charles E.	Anthropology	Quarternary paleoecology of eastern Beringia (Alaska and Yukon)
Scott, Dr. Gerald W.	Surgery	Hydatid disease in the north
Scott, Dr. Harvey A.	Physical Education and Recreation	Northern games: Inuit and Dene Traditional Physical Education and Recreation Documentation Project
Sego, Dr. David C.	Civil Engineering	Ice rubble mechanics. Behaviour of frozen saline soils and ice under low stress
Smith, Dr. Daniel W.	Civil Engineering	Cold climate utilities manual. Lagoon renovation and effluent upgrading
Spady, Dr. Donald W.	Pediatrics	BCG vaccine: immune response and effectiveness
Stirling, Dr. Ian	Zoology	Behaviour and ecology of polar bears and seals
Stockey, Dr. Ruth A.	Botany	Fossil conifers of the northern Yukon, Old Crow Basin
Stott, Dr. Jon C.	English	Native peoples as presented in children's literature
Tonn, Dr. William M.	Zoology	Community ecology and population regulation of fishes in small boreal lakes
Trimbee, Dr. Annette	Zoology	A first look at the importance of denitrification in deep boreal lakes
Urion, Dr. Carl A.	Educational Foundations/ Native Affairs	Native studies
Veeman, Dr. Terrence S.	Economics/ Rural Economy	Environmental and economic aspects of the proposed Slave River dam
Vitt, Dr. Dale	Botany	Peatland ecology of northern Alberta
Waugh, Dr. Earle H.	Religious Studies	The nature and impact of R. Vandersteen's mission on northern native communities
Wayman, Dr. Michael L.	Mineral Engineering	Archaeometallurgical studies of Inuit metal artifacts and native metals
Weijer, Dr. J.	Genetics	Genetic improvement of Alberta native grasses for reclamation, revegetation and soil rehabilitation
Whitaker, Dr. Muriel A.	English	Indian and Eskimo folklore, especially the Raven legends
Wonders, Dr. William Clare	Geography	Northern resources development
Yamamoto, Dr. Tatsuzo	Microbiology	Infectious pancreatic necrosis infections in arctic char. Viruses of walleye
Young, Dr. David E.	Anthropology	Study of northern Cree shaman healing project

Graduate Students	*Department*	*Project*
Abbey, Don H.	Zoology	Factors affecting early life history relationships of juvenile fish in deep boreal lakes
Allison, R.	Anthropology	Thule tent rings at Porden Point, Grinnel Peninsula, Devon Island, N.W.T.
Archer, William	Educational Foundations	Use of computers in Native and rural education
Baker, Mary	Zoology	Production of yellow perch in a small productive Alberta lake
Bobrowsky, Peter T.	Geology	Quaternary geological history of northeastern British Columbia
Bruners, D.	Rural Economy	The role of community learning centres in community development in Yukon
Callaghan, Brian J.	Educational Foundations	Community control of schooling in Nouveau Quebec
Cattet, Marc R.L.	Zoology	Comparative study of the deposition and utilization of fat in the polar bear and black bear
Cote, I.	Zoology	Behaviour of walrus during the breeding season
Court, Gordon S.	Zoology	Ecology and toxicology of tundra peregrine falcons
Damkjar, Eric	Anthropology	Southeastern Somerset Island paleoeskimo project
Derocher, Andrew E.	Zoology	Distribution and abundance of polar bears in western Hudson Bay
Erasmus, W.R.	Anthropology	The development of traditional Dene institutions in the N.W.T.
Evans, David J.A.	Geography	Glacial geology and Quarternary history of Phillips Inlet, northwest Ellesmere Island, N.W.T.
Farrington, Peter	Geography	The CANOL project and its impact on certain subarctic ecosystems — long-term natural responses
Hughes, R.L.	Geology	Sedimentology and regional stratigraphy of gold-bearing Quaternary gravels, Sixty Mile River
Lemmen, Donald S.	Geography	Glacial history of Marvin Peninsula, northern Ellesmere Island, N.W.T.
Nentwich, Franz	Geology	Stratigraphy and sedimentology of the Brodeur Group, Brodeur Peninsula, Baffin Island
Olsen, Chris A.	Animal Science	Critical resources of wapiti in the boreal foothills of Alberta
Park, R.W.	Anthropology	Porden Point Thule Project
Poole, Kim G.	Zoology	Feeding ecology of the gryfalcon in the central arctic, N.W.T.
Ramsay, Malcolm A.	Zoology	Reproductive ecology of polar bears
Schieck, Jim	Zoology	Territorial establishment of willow ptarmigan
Schwalme, Karl	Zoology	Recovery of northern pike from angling stress in an arctic environment
Shaw, Jackie F.H.	Zoology	Towards boreal lake restoration: lake sediments as a phosphorous source in deep lakes in northern Alberta
Shaw, Randall D.	Zoology	Groundwater-lake hydraulic and nutrient interactions in boreal lakes
Stenton, D.R.	Anthropology	Prehistoric inland adaptations in south-central Baffin Island, N.W.T.
Swanson, Leonard	Forest Science	Freeze-thaw cycles on a drained and undrained boreal wetland site
Wilkinson, Craig	Zoology	Feeding plasticity in a top predator

ATHABASCA UNIVERSITY
ATHABASCA, ALBERTA

General information

Athabasca University, P.O. Box 10,000, Athabasca, Alberta T0G 2R0 (403-675-6111) is Canada's distance education university. The entire program is designed to serve students who are unable to avail themselves of traditional university programming.

There are 14,000 course enrollments, the great majority of which come from part-time undergraduate students. The principal faculties are Liberal Studies (Social Sciences, Humanities, Sciences), Administrative Studies (B.A., B.G.S., B. Admin.).

Organization of Northern Studies

There is no specific Northern Studies division although, by its very nature, the institution serves a northern clientele, notably in Alberta, B.C., Saskatchewan, N.W.T. and the Yukon. It also has a number of special projects in Native Studies and native education. The university is presently preparing a series of project proposals for the development of northern studies and specific skill development programming at-a-distance for the North.

Selected northern courses

The Inuit Way is an extremely successful course. There are few others at present with a strong northern element as northern consciousness is a fairly recent phenomenon at the university, but with the move to Athabasca, interest is much stronger and other courses are now in the planning and development stages.

Teaching in the North

The university delivers individualized self-paced home study courses to students all over the North of Canada (notably in Alberta, B.C., Saskatchewan, the Yukon and N.W.T.). It also offers seminar-supported and teleconferenced courses in selected communities and in liaison with various native education councils and northern agencies. AU is Canada's most northerly university, and has a major office in Fort McMurray as well.

Distance Education

As was indicated above, this is Athabasca's specialty. The contact person is Dr. Ross Paul, Vice-President, Learning Services (see Distance Education section of this volume).

Credit transfer

AU has a large office in the Registry dedicated exclusively to transfer credit assessment and a non-resident B.G.S. degree designed particularly for the student who cannot readily fulfill the residency requirements of other institutions. Much of its educational delivery is done in cooperation with other institutions and agencies, including North Island College in B.C., the Sunrise Project in Slave Lake, Blue Quills in St. Paul, the North Peace Educational Consortium, and with a number of community colleges in the north, notably Yukon College and Keyano College.

Northern research

Research is confined to the specific interests of individual faculty members, notably in geology and anthropology. Notable among them is Dr. Don Kvill, a geologist with an interest in northern landforms.

Native Studies

The university has a number of full-time projects run in close liaison with native education councils, notably those in Blue Quills (St. Paul, Alberta), Sunrise (Slave Lake, Alberta) and Morley, Alberta. It has recently hired a Coordinator of Native Studies and has a number of specialist courses in development. Dr. Joseph Couture, a professor of Psychology at the university, is well known for his work in native education and spirituality.

BRANDON UNIVERSITY
BRANDON, MANITOBA

General information

Brandon University, Brandon, Manitoba R7A 6A9, (204-728-9520) has 1263 full-time undergraduate students and 1744 part-time. There are 3 graduate students (in music). The principal faculties are Arts, Science, Education, Music.

Organization of Northern Studies

There is no formal organization of northern studies here, but the nature of Brandon University's service to its community, particularly the Native community, means that many sectors of the University direct their efforts towards the field. The History Department and the

Native Studies Department are particularly involved in Northern Studies.

Selected northern courses

The History Department offers History 422: The Canadian North. Native Studies offers NS 288: The Inuit, as well as a number of courses which include northern topics, such as NS 376: Native Claims Seminar and a number of Native language courses.

Teaching in the North

Members of faculty have been actively involved in Inter-Universities North which involves all of northern Manitoba. The University also runs programs such as BUNTEP (Brandon University Northern Teacher Education Project) and PENT (Project for the Education of Native Teachers) which offer courses in northern communities such as Thompson, Norway House, Split Lake, etc. Several hundred students living in the north have passed through these programmes (see Teacher Education section of this volume).

Distance Education

Courses have been offered in distance education for the past two or three years. This year History 422: The Canadian North, is being offered by means of correspondence and a regular conference phone link to a class living in Snow Lake, the Pas and Flin Flon in the north as well as in several southern communities.

Credit transfer

As well as the usual arrangements for transfer credits to Brandon, the University has a Bachelor of General Studies degree which permits some transfer credit for work done at Community Colleges. Our calendar has the details.

Northern research

Members of the History Department have been particularly active in northern research, publishing three books on northern subjects in the past year.

Members of the Native Studies Department have been active in research in northern Manitoba particularly. Northern scholars include:

Dr. K.S. Coates, History — Yukon, Native People/Missionaries/Government

Dr. W.R. Morrison, History — Yukon and N.W.T./Government/Native People/R.C.M.P.

Dr. A. Blue, Native Studies — N. Manitoba/issues relating to Native primary school educational achievement.

Dr. R. Annis, Native Studies — N. Manitoba/use of Native language.

Sample publications are:

K.S. Coates, *Canada's Colonies* (Toronto, 1985); W.R. Morrison, *Showing the Flag: The Mounted Police and Canadian Sovereignty in the North, 1894-1925* (Vancouver, 1985).

Native Studies

Brandon University has more Native students per capita than any University in Canada, and perhaps more in absolute numbers as well. Our Native Studies Department, set up in 1972, offers a three and four-year major. As well as the Native Studies Department, the University is heavily involved in the field through programmes aimed at Native people in northern Manitoba, particularly PENT (Project for the Education of Native Teachers, 1971), which trains people who are already employed as teachers' assistants in northern communities. The other major project is BUNTEP (Brandon University Northern Teacher Education Project), a teacher training programme offered at communities such as Fairford, Norway House, Cross Lake and Thompson.

UNIVERSITY OF BRITISH COLUMBIA
VANCOUVER, B.C.

General information

Inquiries to:

The Office of the Registrar,
The University of British Columbia,
204-2075 Wesbrook Mall,
Vancouver, B.C., V6T 1Z2
604-228-2844

Enrolment (1985-86): 27,300

Full-time	21,000
Part-time	6,300
Undergraduates	23,400
Graduate students	3,900

Faculties: 12

Agricultural Sciences; Applied Science; Arts; Commerce and Business Administration; Dentistry; Education; Forestry; Graduate Studies; Law; Medicine; Pharmaceutical Sciences; Science.

Schools: 9

Architecture, Audiology and Speech Sciences; Community and Regional Planning; Family and Nutritional Sciences; Library, Archival and Information Studies; Music; Physical Education and Recreation; Rehabilitation Medicine; Social Work.

Subject areas of northern research interest

Anthropology
- Archaeology
- Human Ecology
- Myths/Legends

Botany
- Biogeography
- Ecology
- Genetics

Commerce and Business
- Territorial Tax Structures

Education
- Indian Teacher Education

Engineering
- Civil
- Metallurgical

Forestry
- Remote Sensing
- Wildlife Management

Geography
- Climatology
- Economic Development
- Geomorphology
- Historical Geography
- Permafrost

Geological Sciences
- Petrology
- Stratigraphy

Geophysics
- Glaciology
- Magnetism

History
- Fur Trade

Human Nutrition

Law
- Native Law
- Environmental Law

Political Studies
- Indian Studies
- Land Claims

Planning
- Northern Resources
- Public decision making

Psychology
- Environmental stress

Soils

Zoology
- Animal Behaviour
- Entomology
- Ichthyology
- Mammalogy

Northern Studies, organization and teaching

The President has an Advisory Committee — the Arctic and Alpine Research Committee — which comments on policy issues of interest to the university in Northern matters. It also deals with the Northern Scientific Training Program (NSTP) funding. Chairman: J.K. Stager (604) 228-4627. Recently the President has had an *ad hoc* Committee on Native Issues; the consequences are still unknown.

Most initiatives in Northern Studies are generated within the confines of the discipline units on the campus which give rise to the research directions of graduate students and faculty. There are some 25-30 undergraduate courses that have some content relating to the North, with about 8 courses that deal prominently with northern areas.

The university has for over 10 years delivered undergraduate courses in Whitehorse, Y.T. mainly in Arts subjects, and one Science-Geology — plus a few Education courses in connection with a program to provide the opportunity for Yukon residents to work towards a degree in Education which requires only one year on the UBC campus. Funds are provided by contract with the Yukon Territorial Government (see Distance Education section of this volume).

The Faculty of Education has for a long time operated a Native Indian Teacher Education Program that requires all the basics of a Bachelor of Education degree but provides flexibility in the structuring of course work and practicum periods. Mature entry is controlled by the Senate Admissions Committee.

The Faculty of Law provides a program for Native Law students. Students and graduates are mainly from B.C. and the Yukon.

Examples of recent northern research projects

Bohm, B. (Botany)	Secondary chemistry and food plant choice by snowshoe hares
Bunnell, F.L. (Forestry)	Productivity of gyrfalcons in response to ptarmigan abundance
Campanella, R.G. (Civil Engineering)	A test of innovative site investigation equipment developed at UBC
Clarke, G.K.C. (Geophysics)	Subglacial processes in a surging glacier Filling history of Lake Alsek An impulse radar system to monitor changes in glacial water storage Fine detail mapping of a 500m × 500m region of Trapridge Glacier
Dorcey, H.J. (Planning)	Water management options for Mackenzie River basin
Hall, K.J. (Planning)	Water management options for Mackenzie River basin
Krebs, C.J. (Zoology)	Competition between small rodents in the Kluane Lake region The social behaviour of the singing vole Population density of the deer mouse Study of the use of space in the Chipmunk *Eutemios minimus* Analysis of red squirrel population dynamics Relationship between space use and social structure in the least chipmunk, *Eutamias minimus* Analysis of red squirrel population dynamics
Ovenden, M. (Astronomy)	Stone Circle Evaluation
Pokotylo, D.L. (Archaeology)	Clear range archaeological project

	Mountain Dene ethnoarchaeology Prehistoric technology and economy in the central subarctic Subarctic ceramic technology project
Ray, A.J. (History)	The Indians of the Yukon, 1840-1950
Rees, W.E. (Planning)	Properties and requirements of successful local-based development initiatives North of 60° Development of a framework for socioeconomic monitoring in the Beaufort Region
Riddington, R. (Anthropology)	A study of contemporary bison herds to gain insights into the reasons for the destruction of bison herds
Scudder, G.G.E. (Zoology)	Biosystematics, life cycle strategies and coexistence in Yukon Geocoris
Sinclair, A.R.E. (Zoology)	The effect of snowshoe hare density on lynx social structure Red squirrel territory and food supply A study of snowshoe hare population decline by infant mortality A study of snowshoe hare mortality due to raptor predation The role of the coyote as a predator of small mammals in the S.W. Yukon Effect of density and/or food availability on the home range size of hares
Stager, J.K. (Geography)	Wildlife harvesting by native people in Northern Yukon
Taylor, R.L. (Botany)	A study of the Newfoundland-Labrador populations of *Rhododendron lapponicum* (Lapland Rosebay)
Thirgood, J.V. (Forestry)	Assessment of natural revegetation of mining disturbances within various ecological regions of the Yukon Territory.

THE UNIVERSITY OF CALGARY
CALGARY, ALBERTA

General information

The University of Calgary, 2500 University Drive NW, Calgary, Alberta T2N 1N4 is a co-educational, non-denominational, public university. It seeks community involvement, both to offer and to gain expertise. Now one of Canada's major educational institutions, the University of Calgary has more than 1,600 faculty members and a full-time equivalent enrollment well over 17,000 students.

Students come to the university to pursue new knowledge and to develop the capacity for critical thought. They choose from a variety of disciplines offered in fourteen faculties: Education, engineering, environmental design, fine arts, general studies, humanities, law, management, medicine, nursing, physical education, science, social science and social welfare.

About 10 per cent of the student body is pursuing advanced degrees in the Faculty of Graduate Studies. The Faculty of Graduate Studies offers programs leading to advanced degrees (masters and doctorates) and the Faculty of Continuing Education offers non-credit instruction in a multitude of subjects.

Northern Studies, teaching and organization including the role of the Arctic Institute of North America

The University of Calgary offers courses in every faculty and department which have application to the North and will be of interest to northerners. Many courses deal specifically with the Canadian North.

A Northern Studies Group, comprised of members of all university faculties and departments exists at the University of Calgary to serve as a focal point for northern teaching and research interests for students and faculty. Over 40 faculty members are available from all disciplines at the university to discuss the northern teaching and research interests of their departments.

The Northern Studies Group is under the aegis of the *Arctic Institute of North America* which administers research funding to students under the Northern Scientific Training Program of Indian and Northern Affairs Canada.

The *Arctic Institute of North America*, located on the 11th floor of the University of Calgary Library Tower, is part of the University of Calgary and Canada's oldest northern research institute. Northerners interested in the many resources of the University of Calgary (courses, library services, students and faculty carrying out research and teaching in the North, selected courses, native studies) should contact the

Arctic Institute of North America of the
University of Calgary
11th Floor, Library Tower
Calgary, Alberta
T2N 1N4
Telephone: (403) 220-7515

Northern research

The University is a community of scholars, where faculty and students form a partnership in the discovery, study and dissemination of knowledge. The quality of a university is determined by the research done by its faculty and graduate students.

The income raised by faculty members from government agencies and private industry was about $40 million in 1985, up from just $8 million in 1979. And it continues to grow, as the university becomes known for quality and innovation.

The university has installed a Control Data Canada Supercomputer, the first of its kind at a Canadian university. Capable of 400 million calculations each second, the supercomputer is providing a real service to researchers in universities and private industries across Canada.

The University of Calgary has established cooperative arrangements with research institutes, centres and groups to develop research in specialized areas. University-owned institutes are researching the Canadian North (The Arctic Institute of North America), the humanities, transportation, the environment and ethnic groups. Other research groups are pursuing studies in biochemistry, space science and software development. In addition, the university has affiliation with 10 independent research institutes and participates in six research consortia.

The University of Calgary has established vital links with industry through the development of joint research programs. A research park just north of the campus is home to several industrial research facilities, while another research park in northwest Calgary is being developed in conjunction with the Calgary Research and Development Authority.

Campus activities

The University of Calgary offers many cultural and recreational opportunities for the general public. Drama, dance, and music productions are featured in the University and Boris Roubakine theaters. Feature films are presented by the Students' Union. The Nickle Arts Museum, home to an extensive collection of rare coins and a permanent art collection, puts on special exhibitions. Public lectures serve the most general and specialized interests.

The Physical Education Faculty offers exciting spectator sports from football to volleyball, from swimming to hockey.

Guided tours of the university can be arranged. Arrangements can be made to take advantage of campus recreational programs and to use the library's facilities.

Building for 1988

The excitement of the 1988 Winter Olympic Games in Calgary is already building on The University of Calgary campus.

The University of Calgary will play an important role during the two weeks of the Winter Olympics as the site of the speedskating competitions and the Athletes Village and host to the thousands of athletes, coaches and visitors from hundreds of nations.

Preparations are well under way. A total of $107 million worth of Olympic-related construction is in progress. The Olympic Oval, site of the speedskating events and the world's only covered speedskating venue, is under construction. A major expansion to the Physical Education building will accommodate a planned master's program, a sports research program and provide training space for the Olympic athletes. The university is adding to its housing facilities and ancillary services to accommodate the Olympic athletes.

An Olympic Volunteer Centre has been constructed at the university-owned McMahon Stadium, site of the opening ceremonies. McMahon Stadium is undergoing extensive renovations to accommodate the 50,000 people expected to attend the opening of the Games.

Student affairs

The Division of Student Affairs is dedicated to providing services which will enhance students' educational well-being outside the classroom. This division provides liaison services with the Canada Employment Centre on campus. In addition, it has direct responsibility for University Counselling Services, Student Services, University Health Services and Student Awards and Financial Aid.

Student Awards and Financial Aid
Telephone: (403) 220-6925

Student Awards:

1. Acts as a liaison between Student Finances Board and The University of Calgary students.
2. Assists *all* students regarding loan applications and signs necessary confirmation of enrollment forms for their student loans.
3. Offers financial counselling to students having difficulty living on their student loans.
4. Administers the University of Calgary Emergency Loan Fund.

University Counselling Services
Telephone: (403) 220-5893

All students are welcome to visit the Counselling Services to obtain information about, and participate in, the many kinds of individual and group counselling experiences offered by professionally trained counsellors.

Counselling areas include:
- Education and career planning
- Personal counselling
- Testing
- Reading and Study Skills Program
- Career Resources Centre
- Prospective Students Information Sessions

Student Services
Telephone: (403) 220-7531

Student services offer support and direction dealing with non-academic problems which students may encounter.

1. Assists prospective students in their decision-making about University, offering services such as school visitations, Information nights, University Days, and a wide variety of special publications.
2. Makes the transition to University less difficult for new students through orientation programmes

which are held throughout the summer. In addition, a parent/spouse orientation is offered, and there are special publications for new students.

3. Assists International and CIDA students in adjusting to their new environment by providing advice and literature concerning accommodation, finances, and immigration regulations.
4. Aids disabled students, with special concern for their accessibility to the campus. Special areas are reserved for such students with mechanical book readers, special tape recorders, a Kurzweil Reader, and a computer terminal with audio capability. A wheelchair is also available for emergency use.
5. Assists adult students with their concerns on arrival, and while attending University. A drop-in centre for adult students is located here. An adult student handbook is produced.
6. Houses the International Education Information Centre, with reference materials on work and study overseas, and information on International Education.
7. Screens, interviews and recommends candidates for CUSO (Canadian University Service Overseas).
8. Assists part-time students with printed information and operates a drop-in centre in the early evenings Monday through Thursday during the Fall and Winter session.
9. Co-ordinates services of interest for those concerned with Women's issues.
10. Refers other enquiries to appropriate individuals or departments on campus.

Admission and registration

Admission of all students (full-time, part-time, visiting and unclassified) except students in the Faculty of Graduate Studies, Law, Medicine and Environmental Design, is the responsibility of the Registrar.

The Registrar's Office will accept your inquiries at any time. Please contact:

Telephone numbers:
The Registrar — (403) 220-5510
Director of Admission — (403) 220-6640
Student Information — (403) 220-5512

For basis admission The University of Calgary requires Alberta Grade XII Senior matriculation or equivalent, with a minimum average of 60% on five specified subjects. For complete information and particularly if you have obtained your education in another jurisdiction (such as the North) contact the Admissions Office (403) 220-6640

Native student services

The Native Student Services provides support services to Native Students in the following ways:

A. Academic and Personal Counselling
A staff of tutors and advisors are available to assist students with tutoring, personal and financial counselling and orientation. Other programs include a film series, guest speakers, monthly newsletter and workshops and seminars on study skills, university life, etc. Regular tutorials in certain subject areas are conducted to clarify lecture material and specialist tutors are available in other subjects.

B. Study Centre
A study centre with the necessary facilities such as typewriters, a micro computer, study carrels, and a small resource library is available for students' use.

C. Red Lodge
The Red Lodge is a drop-in centre where students can relax, enjoy a cup of coffee and develop new friendships.

D. Native Student Club
The Native Students have organized a Club and elect their executive on a yearly basis. The purpose of the Club is to promote social, cultural and recreational programs. The Club has established a yearly pow wow honouring graduates and holds occasional pot-luck lunches. Sports activities are also organized by the Club.

E. Outreach Programs
University courses are taken to off-campus locations where Native people live, e.g. Fort Chipewyan, Yellowknife, Grouard, Morley, Hobbema, and downtown Calgary.

F. Admission Requirements
Applications may be admitted without high school matriculation as adult students if they are over 21 years of age and have certain other qualifications, such as English 30, Math 30 or a language other than English. A special transition year program is available for students who are 21 years of age but not yet qualified for adult admission.

Advice is available for students who write or telephone the Native Student Services.
Telephone: (403) 220-6064

Special sessions

A. Spring/Summer Sessions
The traditional summer session has been greatly enlarged to become the Spring/Summer Sessions, with graduate and undergraduate degree-credit classes available both on and off-campus from early May to the middle of August. Specific course groupings emphasizing particular aspects of a discipline or emphasizing a specific topic covered by several disciplines are offered each summer. Information regarding the nature of these courses is available from the Special Sessions office.
Telephone: (403) 220-4989

B. Off-Campus Credit
The Faculty of Continuing Education organizes off-campus classes. They are generally provided as a service to students at various locations when demand at a given locality warrants their offering. Further information is available for northerners interested.
Telephone: (403) 220-7208

Non-degree programs

More and more persons, both university graduates and non-graduates, are finding themselves in occupations which demand university level knowledge. In many professions it is now very difficult to calculate in advance the precise content that should be included in pre-career training programmes. The growth of computer technology, of new management practices, of complex societal and environmental issues, and so on make it hard to predict what professional persons will need to know in a few years' time. The Faculty works in close co-operation with the various faculties and departments of the University, as well as with outside resource people, to help individuals obtain those additional elements of education which they feel they require. For further information:

Telephone: (403) 220-5431

Distance Education/teleconferencing

Educational teleconferencing is an exciting and unique instructional medium, with particular relevance for northern applications. The University of Calgary has one of the country's finest teleconferencing facilities, operated by the Faculty of Continuing Education/Teleconferencing Office. Origination of Educational Teleconferencing courses is usually from the University of Calgary, but it is also possible for a program to originate anywhere there is access to a telephone. Guest instructors from anywhere in North America can be patched through the University control facility, offering students expertise unavailable in most classroom situations. With specially adapted microphones even music courses can be taught on this system. Students have no difficulty using the teleconference equipment, and do not require any special training.

The University of Calgary system has been utilized by a wide variety of clients, including the Arctic Co-operative Federation, for training purposes.

Telephone (403) 220-7477

CONCORDIA UNIVERSITY
MONTREAL, QUEBEC

General information

Concordia University
1455 de Maisonneuve Blvd. West
Montreal, Quebec
H3G 1M8 (Main telephone number 514-848-2424) has 11,599 full-time and 8,614 part-time undergraduates, 1,655 full-time and 1,312 part-time graduate students and 2,956 independent students. The faculties are as follows:

Faculty of Arts & Science	514-848-2080
Faculty of Commerce and Administration	848-2700
Faculty of Engineering and Computer Science	848-3200
Faculty of Fine Arts	848-4705
Centre for Mature Students	848-3890
Institute for Cooperative Education	848-3950
Liberal Arts College	848-2565
Longergan University College	848-2280
School of Community and Public Affairs	848-2575
Science College	848-2595
Women's Studies	848-2370
Centre for the Teaching of English as a Second Language	848-2450
Centre for Continuing Education	848-3600

Organization of Northern Studies

No staff specifically assigned full-time to Northern Studies, but several faculty members maintain strong working relationships with the North, particularly in Communications, Journalism, Education, and English as a Second Language.

Contact: ACUNS Representative
Chair, Northern Studies Committee: Ronald Mackay Tel. 514-848-2451

Selected northern courses

Various graduate and some undergraduate courses have substantial northern content, e.g.

Centre for Teaching English as a Second Language
- Methodology
- Syllabus Design and Materials Development
- Bilingualism
- Administration
- Program Evaluation

Department of History
- History of the Canadian North

Department of Communication Studies
- Communication and the Canadian North

Department of Education
- Distance Education
- Educational Technology in Developing Nations

Teaching in the North

Faculty from the TESL Centre have frequently contributed to in-service training for teachers in the Northwest Territories and Arctic Quebec.

Distance Education

T.V. Course in The History of the English Language
Contact: Mary Petrie, Tel. 514-848-2452.

Cooperative Education

Centre for Cooperative Education

Three programs leading to Bachelor level degrees.
Chemistry (Chemistry; Biochemistry; Analytical Chemistry)
Mathematics (Actuarial; Statistical; Applied)
Economics

Students are paid during 4-month internships. Internships are in the industrial and public service sectors, and can be in any part of Canada. Up to 25 students per program per year are admitted.

Contact: John Fiset, Assistant Director
Tel. 514-848-3952

Selected northern projects

TESL Centre

The cost of Inuktitut as an Official Language in Nunavut DIAND 1984

Evaluation Report: Community Health Representative Training Program, Teacher's Press, 1984.

The English Language demands made on Inuit students in English-medium education. (On-going)

DIAND Northern Scientific Training Program grant for 1986 — $3,000 for two student projects, both in the field of English language education.

Department of Communication Studies

Evaluation, Fieldwork Reports on Five Native Communication Societies, Native Communications Programme, Department of Secretary of State, Ottawa, 1977.

Evaluation Design, Community Learning Centers, Department of Extension Services, Memorial University, St. John's, Newfoundland, 1978.

Research and Writing, Audio-Visual Training Kit on Native and Non-native Communication Patterns, Department of Indian and Northern Affairs, Ottawa, 1978.

Evaluation, Naalakvik I Hermes Satellite Experiment in Audio Networking, Tagramiut Nipingat Inc., Sugluk, Quebec, 1977.

Evaluation, Inukshuk Anik B Satellite Experiment in Audio and Video Networking, Inuit Tapirisat of Canada, Ottawa, 1978-1981.

Audience Survey, Inuit Broadcasting Corporation, 1984, 1985, 1986.

Interaction patterns of Inuit and non-Inuit and the role of contemporary media.

Evaluation, Northern Communications Program and Northern Native Broadcast Access Program, Department of Secretary of State, 1986.

Department of Education (Educational Technology)

Longitudinal Study of Television Impact and Inuit Adolescents, Eastern Arctic, 1972-1985.

Department of History

The Government of Canada and the Inuit 1900-1967, DIAND, Ottawa, 1986.

Conference

Etudes Inuit Studies Conference, Concordia University, November 1984.

Northern specialists at Concordia:

Palmer Acheson — TESL Centre

Gary Coldevin — Educational Technology

Richard Diubaldo — History Department

Ronald Mackay — TESL Centre

Gail Valaskakis — Communication Studies Department

Also, Graduate Students working in Northern Communications at M.A. and Ph.D. level.

Native Studies

In addition to the above, a diagnostic evaluation (education) is being carried out for the Conne River Indian Band, Newfoundland.

DALHOUSIE UNIVERSITY
HALIFAX, NOVA SCOTIA

General information

Dalhousie University, Halifax, Nova Scotia B3H 4H6 (902-424-2211) had the following enrollment by faculty as of December 1985:

Faculty	Full time	Part time	Total
Arts and Science	3664	714	4378
Dentistry	229	—	229
Graduate Studies	1101	545	1646
Health Professions	1171	390	1561
Law	445	5	450
Management Studies	777	185	962
Medicine	767	—	767
Arts and Science (King's College)	521	16	537
	8675	1855	10530

The major faculties, professional schools and institutes are:

Faculty of Arts and Science (the humanities, the physical, life and social sciences, some performing arts, education, introductory years in engineering)

Faculty of Health Professions (nursing, occupational therapy, pharmacy, recreation, physical and health education, physiotherapy, human communication disorders and social work)

Faculty of Management Studies (commerce and business administration, public administration, library service, health administration)

Faculty of Medicine (basic medical sciences, medicine, medical internship and clinical specializations, continuing medical education)

Faculty of Law

Faculty of Dentistry (dentistry, dental hygiene, and continuing dental education)

Faculty of Graduate Studies (advanced study in the humanities, the physical, life, social, and medical sciences, and a number of professions).

Coordination of continuing education programs both for degree credit and part-time studies and community education activities are being organized under the responsibilities of the Dean of Continuing Education.

Schools and Colleges

Business Administration
Dental Hygiene
Human Communication Disorders
Library Service
Maritime School of Social Work
Nursing
Occupational Therapy
Pharmacy
Physiotherapy
Public Administration
Recreation, Physical and Health Education

Institutes and Centres

Applied Microelectronics Institute
Atlantic Institute of Criminology
Atlantic Region Magnetic Resonance Centre
Atlantic Research Centre for Mental Retardation
Canadian Centre for Marine Transportation
Centre for African Studies
Centre for Foreign Policy Studies
Centre for International Business Studies
Centre for Marine Geology
Centre for Regional and International Development Projects
Centre for Research in Sensory, Psychology and Medical Physics
Dalhousie Ocean Studies Program
Institute for Resource and Environmental Studies
Institute of Oceanography
Institute of Public Affairs
Trace Analysis Research Centre

Selected northern courses

Biology — 2046 General Ecology (laboratory and lectures mainly concerned with application of ecological issues — fisheries and environmental management) and various courses related to environmental management and issues.

Canadian Studies Programs — Students in any of Economics, English, French, History, Political Science, Sociology and Social Anthropology can focus upon any Canadian subject, using existing classes.

Computing Science — Various courses, graduate or undergraduate studies in business or administrative computing, science and engineering applications *and* specifically mentioned herein because of coop program —see Coop Programs/Special Programs.

Economics — 3332B Resource Economics (economic theory *re* fisheries, and other resource sectors). Other courses of relevance in development economics, econometrics, cost benefit, analysis, micro/macro economics theory. Economics and public policy of interest.

Education — Various courses offered in educational administration as well as education theory and practice. Also note transfer credits from NSTC (see Coop Programs/Special Programs).

English — Various courses in the study of various periods, as well as groupings by type (i.e., Science Fiction and Fantasy).

Geology — 2410B Environmental and Resource Geology (various topics relating to geology and geological hazards, especially in urban areas), along with other courses relating to historical geology and applied geology. Experimental course on Arctic Geology, Autumn 1986, 4th year and graduate.

History — 2212B The Social History of Canada since 1870 (among topics are social classes, role of women, conflicts, Indian-white relations).

— 2250 West by North — to be offered for the first time in 1986/87. This course will review the pattern of development in the Canadian West and North, progressing from pre-settlement era to the present day.

International Development Studies (Degree) — An intercampus interdisciplinary international degree program focuses upon comparative examples of and explanations for change — economic, environmental, social and political in the third world.

Marine Biology (Degree) — An honours program, preparing students for technical positions in marine biology and fisheries and for advanced study/research training. Drawing upon the existing resources of the Departments of Biology and Oceanography and other marine related sciences.

Oceanography — An interdisciplinary program includes studies of tides and currents, chemistry of sea water, plants and animals that live under the sea, and ocean bottom sediments and underlying crystal structures. Requires a background in basic science. Career oceanographers are employed in universities, fisheries investigation, mineral explorations, studies of ice in navigable waters, and a number of private companies interested in marine environmental protection.

Physics — Including a diploma in meteorology.

Political Science — 4266A Natural Resource Administration in Canada

— 5266A Examination of natural resource policies (formation and administration) in Canada.

— 3340A 5340A Problems and Development — the Politics of New States

Survey of theories of and policies about dependance under development and peripheral social formations —

with special emphasis on modernization and materialistic modes of analysis.

Department offers a wide range of programs on Canadian government and politics, comparative political science, political theory and methodology, international politics and foreign policy.

Sociology and social Anthropology — Studies in sociology (human cooperative efforts — institutions, relations and processes of change).

Studies in social anthropology (review of human species in all of its physical, cultural and linguistic diversity).

School of Dental Hygiene — For training of legally qualified auxiliary to the dental profession.

Faculty of Health Professions — Various programs (graduate and undergraduate) in the fields of Nursing, Pharmacy, School of Recreation, Physical and Health Education, Occupational Theory and Human Communication Disorders, and Social Work. Contact — Dr. R.S. Tonks, Dean.

Faculty of Management Studies — Offering programs (graduate and undergraduate) in the fields of Business and Public Administration.

Distance Education

1. Correspondence Programs

(a). Municipal managers, assessors are trained in skills relevant to their respective professions via a series of practical, carefully developed correspondence courses (augmented) by teleconferencing and in-house and/or location seminar program. These are general skills programs, and do not address issues specific to the North, although there may well be relevance in content and in manner of delivery. Contact J.R. MacMillan, Registrar, Municipal Administration Program, Department of Continuing Education, (902) 424-2526.

(b). DUET Program

The Distance Education and Educational Division of Henson College, Dalhousie University has been established to assist Dalhousie Faculties and Departments in the extension of their resources to locations remote from campus. Three communication technologies (audio, video, and data) are used by a number of degree granting institutions to: a) provide extended service to students, b) effect savings, and c) share institutional resources. Additionally, this program participates in a computer networking project sponsored by the A.A.U. office of Educational Communications. The project supports an electronic bulletin board as well as a monthly Newsletter containing items about communications technologies in the region.

For more information contact:

Katharine D. Rice
Distance Education and Educational Technology
Henson College
1261 Seymour St.
Halifax, N.S.
B3H 3J5

2. Diploma Program for Registered Nurses in Outpost and Community Health Nursing

A 15-month program in Outpost and Community Health Nursing is offered in cooperation with the University Medical School and Medical Services Branch, Health and Welfare Canada, and prepares registered nurses for positions in remote areas of northern Canada where medical care by resident doctors is not continuously available. Instruction during the program is highly individualized and clinically oriented. One academic year, extending over a period of approx. 8 months, is spent at the University. This is followed by a 28-week University-directed internship which is spent in remote areas of Canada. A diploma in Outpost and Community Health Nursing is awarded at the completion of the program. Students are admitted to the program in September and in January.

Admission Requirements:

(a) Nova Scotia grade XII or equivalent
(b) Current registration in a province or territory in Canada or recognized equivalent
(c) At least 1 year of graduate nursing experience, 2 weeks of which must have been spent at a northern nursing station
(d) Admission preference is given to nurses currently employed by Medical Services Branch, Health and Welfare Canada. Other nurses are considered for admission if they agree to employment with Medical Services upon completion of the program
(e) Fees and a living allowance are paid by Medical Services Branch, Health and Welfare Canada to all students. In return, all students are committed to a period of employment with Medical Services after completion of the program.

Course of Study for Outpost Nursing:

First year: to be spent at the University. Nursing 0550A and B, 0640A, 0930A or B, 0940A or B, 0950A or B, 0960B, 4800B. Health Education 1163A.

Internship: in remote areas of Canada. Nursing 09191A or B, 0913A or B, 0196A or B.

Graduate Program: for details of the Master's Nursing program, please consult the Faculty of Graduate Studies calendar.

For more information contact:

Ms. P.N. Stern
Director, School of Nursing
Dalhousie University
5963 College St.
Halifax, N.S.
B3H 1X6

Coop programs/special programs — see Distance Education, above

Cooperative education programs

Certain departments, currently Chemistry, Physics and Mathematics and Statistics and Computing Science, offer integrated programs of academic study and supervised work terms.

Contact on all coop programs through:

Office of the Dean of Arts and Science
3rd Floor, Arts and Administration Building
Dalhousie University
Halifax, N.S.
B3H 4H6
(902) 424-3540

The Canadian Northern Waters Project

A Donner Canadian Foundation funded Canadian Northern Waters Project which disseminates research findings, expands contacts with the national and international northern affairs "Community" and focuses attention on Arctic issues within the Dalhousie academic community. Specific recent activities include publications:

Transit Management in the Northwest Passage: Problems and Prospects
(Cynthia Lamson and David VanderZwaag, editors)

The Waters of the Canadian Archipelago in International Law
(Donat Pharand, author).

Both are to be released in 1986.

Papers presented at the Banff, Alberta, October 1984 U.S. Canadian Arctic Issues Forum and at the August 1985 ACUNS/IUCN Arctic Heritage Symposium.

Research Projects and Grants including SSHRCC funded project, "Towards Regional Ocean Management and Development in Baffin Bay/Davis Strait".

A Dalhousie campus Arctic Seminar series, featuring historians, policy-makers, explorers and film-makers.

For more information contact:

C. Lamson or D. VanderZwaag
Dalhousie Ocean Sudies Program
Dalhousie University
1236 Henry St., 5th Floor,
Halifax, N.S.

Northern specialists and research projects

Dr. Barrie D. Clarke Dr. Gunter Muecke Geology Department	Magmatic evolution of the Sverdrup Basin and its margins.
Dr. B. Freedman Biology Department	Ecology of a high Arctic oasis at Alexandra Fiord, Ellesmere Island.
Dr. Douglas M. Johnston Cynthia Lamson David VanderZwaag Dalhousie Ocean Studies Program	Transit management in the Northwest passage: problems and prospects. Science and environmental assessment of arctic marine shipping proposals.
Prof. J. Gratwick Canadian Marine Transportation Centre	Arctic shipping.
Prof. I. Townsend-Gault Law School	Arctic oil and gas regulation
Dr. Franco S. Medioli Geology Department	Distribution and taxonomy of benthonic Foramnifera in Lancaster Sound and Baffin Bay. Distribution and taxonomy of Arcellaceans (Thecamoebians) in selected lakes and ponds of Baffin Island.
Dr. Ian A. McLaren Biology Department	Total DNA and development rate in Pseudocalanus species in Ogac Lake, N.W.T.
Dr. Robert M. Moore Oceanography Department	Chemical aspects of processes occurring on the Beaufort Sea shelf.
Dr. James G. Ogden Biology Department	Arctic paleoecology.
Dr. David B. Scott Geology Department	Modern distributions and biostratigraphy of benthonic Foraminifera in CESAR cores, also oxygen-carbon isotopes of

	planktonic and benthonic species.
Dr. Marion Lewis Oceanography Department	Photosynthetic efficiency of arctic ice algae.
Dr. Keith Louden Oceanography Department	Geothermal studies of the Queen Elizabeth Islands shelf.

ÉCOLE POLYTECHNIQUE MONTRÉAL, QUÉBEC

Renseignements généraux

Centre d'ingénierie nordique de l'École Polytechnique (CINEP)
École Polytechnique
C.P. 6079, Succ. "A"
Montréal, (Québec)
H3C 3A7
Responsable: Dr. B. Ladanyi, Directeur
Téléphone: 514-340-4804

Nombre d'étudiants (Automne 1985)

Premier cycle:	à plein temps	3 590
	à temps partiel	263
2e et 3e cycle:	à plein temps	348
	à temps partiel	562

Principaux départements et instituts

Mathématiques appliquées
Génie civil
Génie mécanique
Génie électrique
Génie chimique
Génie métallurique
Génie minéral
Génie physique
Génie industriel
Institut de génie nucléaire.

Organisation des études nordiques

Personne à contacter:
Dr. B. Ladanyi
Professeur titulaire
Dépt. de Génie civil
Directeur du CINEP
Tél: (514) 340-4804

La formation d'ingénieurs et de chercheurs en ingénierie nordique a demeuré une priorité essentielle du Centre depuis sa formation en 1970. En conséquence, certains membres du CINEP, aidés par des professeurs invités, offrent, à l'intérieur du programme régulier des cours offerts par l'École Polytechnique, des cours portant spécifiquement sur des domaines reliés à l'ingénierie nordique.

En outre, depuis quelques années, le CINEP tâche de mettre sur pied un programme de maîtrise en ingénierie (M.Ing.) qui porterait sur l'ingénierie nordique. On espère pouvoir réaliser ce projet dès que la clientèle étudiante le justifie.

Dans le but de favoriser l'accès à l'information scientifique disponible, le CINEP a établi un *Centre de documentation en ingénierie nordique*, (Bibliothèque spécialisée), comptant environ 12,000 documents dont la plupart sont classés selon la méthode informatisée KWIC (Keywords in Context). Un tel mode de classification permet le repérage des documents à partir, soit d'une liste alphabétique de mots-clefs, soit d'une liste alphabétique des auteurs. Cette documentation est disponible pour consultation aux chercheurs de l'École Polytechnique, ainsi qu'aux étudiants et aux personnes de l'extérieur intéressées à venir consulter la documentation sur place. Le Centre n'offre pas de service de recherche bibliographique.

Domaines d'intérêt, thèmes et régions de la recherche nordique

Les domaines d'études nordiques auxquels l'École accorde un intérêt particulier sont.

Pergélisol
Génie civil
Construction
Génie électrique
Génie mécanique
Génie minier
Neige et glace
Mécanique des sols
Glace
Pollution

Bien que nos études en ingénierie nordique ne soient pas liées à une région particulière du nord, nos travaux sur le terrain jusqu'à présent ont été effectués surtout dans la région du Nouveau Québec (Schefferville, Baie James, Poste-de-la-Baleine), au Manitoba (Thompson), au Yukon (Dawson City) et aux Territoires du Nord-Ouest (Inuvik, Igloolik).

Notre intérêt particulier se situe présentement dans la région de la Mer de Beaufort, en relation avec les forages pour le pétrole et la construction des plateformes de forage et des îles artificielles.

Cours nordiques

Au niveau de baccalauréat (1er cycle).

Cours 1.535 — Ingénierie nordique.
Ce cours de 3 crédits, enseigné par B. Ladanyi et ses collaborateurs, porte: (1) Sur les problèmes de

construction dans le Nord, surtout ceux liés au froid et à la présence du pergélisol. (2) Sur l'environnement nordique, ci-inclus les problèmes de l'approvisionnement en eau de consommation, de l'épuration des eaux usées et de la gestion des déchets solides: et (3) Planification des agglomérations nordiques.

Au niveau des grades supérieurs (2e et 3 e cycle)

Cours 1.635 — Géotechnique des régions froides. Ce cours de 3 crédits enseigné par B. Ladanyi, porte sur la détermination des propriétés thermiques et mécaniques des sols gelés et leur utilisation dans la conception des ouvrages de génie civil dans le Nord.

Cours 3.625 — Ingénierie électrique dans les régions froides. Ce cours de 3 crédits enseigné par D. Mukhedkar et ses collaborateurs, porte surtout sur les problèmes de construction des lignes de transmission dans le Nord, et ceux de mise à la terre en pergélisol.

L'enseignement dans le Nord

Le Centre n'a pas encore organisé de *cours dans le Nord*, destinés aux habitants du Nord. Toutefois, des équipes de nos étudiants et chercheurs ont utilisé depuis 1970 des services et des facilités des stations nordiques de l'Université Laval au Poste-de-la-Baleine, de la Société de l'Énergie de la Baie James à Radisson, ainsi que celles du Ministère des Affaires indiennes et du Nord à Inuvik et à Igloolik.

L'enseignement à distance

En ce qui concerne *l'enseignement à distance*, l'École n'offre pas encore de programmes qui concernent directement le Nord. Cependant, d'une manière générale, ce potentiel existe dans certains domaines du génie. Pour plus de renseignements, contacter, M. Claude Dubeau, Directeur du Service de l'éducation permanente, tél: (514) 340-4700.

Programmes de cours en alternance et transférabilité des crédits de cours.

a) Les étudiants sortant d'un collège sont admis en première année selon les règlements de l'École.
b) Transfert à l'École à partir d'une autre université canadienne ne présente aucun problème, à condition que ce soit dans un programme enseigné à l'École. Toutefois, chaque dossier est étudié séparément pour établir l'équivalence des crédits.
c) En 2e et 3e cycles, l'acceptation se fait sur la base des dossiers des candidats.
d) Vu que tous les cours sont enseignés en français, une connaissance suffisante de cette langue est essentielle.

La recherche nordique

Selon le dernier rapport annuel du Centre, durant la période 1981-83, 27 projets de recherche ont été activement poursuivis par les chercheurs du Centre. Le personnel y impliqué comprenait: 21 professeurs, 5 chercheurs professionnels, 42 étudiants des 2ième et 3ième cycles, 3 étudiants du 1er cycle et 17 techniciens. Les résultats des travaux de recherche nordique ont donné lieu, dans la même période de 2 ans, à 70 nouvelles publications, rapports et thèses sur différents sujets d'ingénierie nordique.

Dans cette période, et en majorité jusqu'à présent, les domaines préférentiels de recherche nordique ont été: le génie de l'environnement nordique, la géotechnique nordique et le comportement dans le Nord des matériaux et des machines. On donne dans la suite une liste des projets de recherche poursuivis et des personnes en charge de ceux-ci.

Dans le domaine du Génie civil:

a) *Sections : Environnement Nordique et Hydraulique*

— Effets des précipitations acides sur la faune — ressource des populations autochtones au Nouveau-Québec.
(Responsable: C.E. Delisle)

— Étude des indicateurs de qualité de l'eau potable en milieu froid
(Responsable: A.J. Drapeau)

— Étude du traitement des eaux usées en climats froids, et en particulier: "Conception et évaluation du lagunage des eaux usées" et "l'Utilisation des zones humides pour l'épuration des eaux usées".
(Responsable: R. Labonté)

— Étude de la migration des contaminants et de leurs dispersion dans les terrains nordiques.
(Responsable: C. Marche)

Sections : Géotechnique et Structures

— Étude fondamentale des propriétés mécaniques des sols gelés.
(Responsable: B. Ladanyi).
Elle contient 3 sous-projets:

"Étude de la consolidation des sols gelés",
"Étude des propriétés des sols gelés à des températures cryogéniques".
"Étude des contraintes intergranulaires dans le sable gelé."

— Influence du mode de compaction sur la gélivité des moraines glaciaires.
(Responsable: B. Ladanyi).

— Conception et comportement des fondations et des gazoducs dans le pergélisol.
(Responsable: B. Ladanyi).
Ce projet comprend 5 sous-projets, portant surtout sur la mesure des paramètres de fluage des sols gelés et de la glace au moyen de certains essais *in-situ*, et sur l'utilisation de ces paramètres dans la conception des fondations, ainsi que des gazoducs, refroidis, enterrés dans le pergélisol discontinu.

— Étude expérimentale de la capacité portante de la glace de mer et de son comportement en fluage.
(Responsables: R. Tinawi et J.-R. Murat)

— Résistance des bétons gelés prématurément et méthodes d'évaluation des dommages causés.
(Responsable: J. Houde).

Section: Transport

— Évaluation des méthodes de conception et des techniques d'entretien des routes dans le Nord.

(Responsable jusqu'à 1984, J. Hode-Keyser). Ce projet est temporairement arrêté à cause du décès du chercheur principal, M. Hode-Keyser, en avril 1984.

Dans le domaine du génie mécanique:

- Étude du comportement et de la fiabilité des motoneiges utilisés dans le Nord.
  (Responsable: M. Gou).
- Effet des basses températures sur le comportement des circuits oléo-hydrauliques.
  (Responsable: H. Yelle).
- Stockage thermique domestique et industriel avec application dans les régions froides.
  (Responsable: E. Bilgen).

Dans le domaine du génie métallurgique:

- Étude des vitesses et des mécanismes de préparation des fissures en fatigue à basses températures.
  (Responsable: J.-I. Dickson).

Tel que mentionné ci-dessus, pour la réalisation de ces projets les chercheurs du Centre ont utilisé des stations et des facilités de différents organismes, comprenant celles du MAIN à Inuvik et à Igloolik. Certains chercheurs du Centre ont également profité du Programme de formation scientifique dans le Nord, administré par le MAIN pour envoyer les groupes d'étudiants dans le Nord, en relation avec les projets de recherche en environnement nordique et avec le comportement des routes dans le Nord. Toutefois, pendant la dernière décenie, la plupart de fonds d'infrastructure du Centre provenaient des subventions du Programme de formation des chercheurs (FCAC) du Ministère de l'éducation du Québec.

L'organisation des rencontres

Depuis 1981, le Centre a participé à *l'organisation des rencontres* suivantes:

- avec la collaboration de l'Environnement Canada: "Colloque sur l'Environnement nordique", Montréal, 18-19 février 1982.
- avec la collaboration de AQTE, Environnement Canada, Environnement Québec, UQAM: "Colloque sur les précipitations acides", UQAM, 28-29 octobre 1982.
- avec la SEBJ et le Centre d'études nordiques et de recherches de l'Université McGill: "Colloque sur l'habitation nordique", Radisson, Québec, les 22 au 25 mars 1982.
- "Conférence annuelle de l'Association universitaire canadienne d'études nordiques", École Polytechnique, du 4 au 7 mai 1982.
- "Construction dans les régions du pergélisol", Journées Augustin-Frigon, les 18 et 19 octobre 1984.
  Un colloque prochain, prévu pour 1986, portera sur la planification des communautés nordiques.

De plus, le Centre organise régulièrement, au mois de février ou mars de chaque année, une à plusieurs journées d'information en ingénierie nordique, comprenant des conférences-invitées, des expositions et des films nordiques.

Liste des chercheurs principaux actifs dans la recherche nordique à l'École Polytechnique

Nom du professeur — chercheur	Département	Domaines de recherche
Bilgen, Ertugrul	Génie mécanique	Génie mécanique
Brière, François	Génie civil	Génie sanitaire et du milieu ambiant
Delisle, Claude	Génie civil	Études du milieu ambiant
Dickson, J. Ivan	Génie métallurgique	Génie métallurgique
Gou, Michel	Génie mécanique	Génie mécanique
Houde, Jules	Génie civil	Génie civil, Construction
Labonté, Roger	Génie civil	Génie sanitaire et du milieu ambiant
Ladanyi, Branko	Génie civil	Pergélisol, géotechnique Neige et glace, mécanique des sols
Marche, Claude	Génie civil	Hydrologie, génie sanitaire et du milieu ambiant
Murat, J.-Robert	Génie civil	Construction, neige et glace, glace
Tinawi, René	Génie civil	Construction neige et glace, glace
Yelle, Henri	Génie mécanique	Génie mécanique

Publications nordiques

"Rapport de la recherche 1982-1984"
École Polytechnique de Montréal

ÉCOLE POLYTECHNIQUE MONTRÉAL, QUÉBEC

General information

CINEP (Centre for Northern Engineering)
École Polytechnique
P.O. Box 6079, Station "A"
Montréal, Québec
H3C 3A7

Head: Dr. B. Ladanyi, Director

Telephone: 514-340-4804

Number of students (Fall 1985)

Undergraduate,	full-time	3,590
	part-time	263
Graduate,	full-time	348
	part-time	562

Principal departments and institutes

Applied Mathematics
Civil Engineering
Mechanical Engineering
Electrical Engineering
Chemical Engineering
Metallurgical Engineering
Mining Engineering
Physical Engineering
Industrial Engineering
Institute of Nuclear Engineering

Organization of Northern Studies

Contact Person: Dr. B. Ladanyi
Full Professor
Department of Civil Engineering
Director of CINEP
Tel: (514) 340-4804

The training of engineers and researchers in northern engineering has been an essential priority of the Centre since it was established in 1970. Consequently, certain members of CINEP, assisted by visiting professors, offer, within the regular program of courses offered by the École Polytechnique, courses of specific relevance to the areas related to northern engineering.

Moreover, CINEP has been working for several years towards the establishment of a program leading to a master's degree (M.Eng.) directly related to northern engineering. It is hoped that this plan will become a reality as soon as there are enough interested students to justify it.

To encourage access to the available scientific information, CINEP has set up a *Northern Engineering Documentation Centre* (Specialized Library), housing some 12,000 documents, most of which are classified by computer in accordance with the Keyword in Context (KWIC) method. This form of classification makes it possible to retrieve documents either on the basis of an alphabetical list of keywords, or by means of an alphabetical list of authors. The sources are available for consultation by researchers at the École Polytechnique and by students and outside persons who wish to consult them on the premises. The Centre does not offer a bibliographical search service.

Northern research interests, subjects and regions

The areas of Northern Studies in which the École Polytechnique is particularly interested are:

Permafrost
Civil Engineering
Construction
Electrical Engineering
Mechanical Engineering
Mining Engineering
Snow and Ice
Soil Mechanics
Ice
Pollution

Although our studies of northern engineering are not linked to any particular region of the North, our fieldwork has so far been carried out mainly in the Nouveau Québec region (Schefferville, James Bay, Great Whale River), in Manitoba (Thompson), in the Yukon (Dawson City), and in the Northwest Territories (Inuvik, Igloolik).

Our current area of special interest is the Beaufort Sea region, particularly the oil-drilling operations and the construction of drilling platforms and artificial islands.

Courses in Northern Studies

Please note that all courses listed below are given only in French

Undergraduate

Course 1.535 — Northern engineering
A 3-credit course, given by B. Ladanyi and members of his team, covering: (1) problems of construction in the North, especially those which are related to cold and the presence of permafrost; (2) the northern environment, including the problems of drinking water supply, purification of wastewater and management of solid wastes; (3) planning northern urban settlements.

Post-graduate

Course 1.635 — Geotechnics of cold regions. A 3-credit course, given by B. Ladanyi, covering the determination of the thermal and mechanical properties of frozen soils and their application to the design of civil engineering works in the North.

Course 1.625 — Electrical engineering in cold regions. A 3-credit course, given by D. Mukhedkar and members of his team, covering principally the problems of constructing transmission lines in the North and of grounding in permafrost.

Teaching in the North

To date, the Centre has not organized any *courses in the North* intended for northern residents. However, teams composed of our students and researchers have, since 1970, used the services and facilities of the northern research stations of Laval University at Great Whale River, of the James Bay Power Corporation (SEBJ) at Radisson, and those of the Department of Indian Affairs and Northern Development at Inuvik and Igloolik.

Distance Education

École Polytechnique does not yet offer any distance education programs specifically related to the North. The potential for this does, however, exist in a general way in certain fields of engineering. For more information contact Mr. Claude Dubeau, Director of Continuing Education, tel.: (514) 340-4700.

Programs of equivalent courses and transferability of course credits

a) Students arriving from a college are admitted to the first year in accordance with the regulations of École Polytechnique.

b) Transfer to École Polytechnique from another Canadian university presents no problems provided that the student wishes to enter a program offered by the École. However, each case is examined separately to establish credit equivalents.

c) At the post-graduate level acceptance is based on the applicant's record.

d) Since all courses are taught in French, adequate knowledge of this language is essential.

Northern research

The latest annual report of the Centre shows that, in the period 1981-83, there were 27 active research projects being directed by the Centre's researchers. The personnel involved consisted of 21 professors, 5 professional researchers, 42 postgraduate students, 3 undergraduate students and 17 technicians. This northern research work resulted, in the same two-year period, in 70 new publications, reports and theses on various topics in northern engineering.

During this period, and, for the most part, up to the present time, the preferred areas of northern research have been northern environmental engineering, northern geotechnics and the behaviour of materials and machinery in the North. A list of the research projects and the persons in charge of them is given below.

In Civil Engineering:

a) *Sections: Northern Environmental and Hydraulics*

- Effects of acid precipitation on the wildlife resources of the native population of Nouveau Québec.
  (Principal investigator: C.E. Delisle)
- Study of indicators of drinking water quality in a cold environment.
  (Principal investigator: A.J. Drapeau)
- Study of the treatment of waste water in cold climates; in particular, "Design and evaluation of wastewater pond systems" and "The use of wetlands for the purification of wastewater".
  (Principal investigator: R. Labonté)
- Study of the migration of contaminants and their dispersion in northern areas.
  (Principal investigator: C. Marche)

b) *Sections: Geotechnics and Structures*

- Basic study of the mechanical properties of frozen soils.
  (Principal investigator: B. Ladanyi). It comprises 3 sub-projects:
  "Study of the consolidation of frozen soils",
  "Study of the properties of frozen soils at cryogenic temperatures"
  "Study of the intergranular stresses in frozen sand"
- Influence of the mode of compaction on the frost susceptibility of glacial moraines.
  (Principal investigator: B. Ladanyi).
- Design and behaviour of foundations and gas-lines in permafrost.
  (Principal investigator: B. Ladanyi).
  The project comprises 5 sub-projects, aimed principally at measuring the flow parameters of frozen soil and ice by means of certain on-site tests, and at using these parameters for the purpose of designing foundations and gas-lines for chilling and burial in the discontinuous permafrost.
- Experimental study of the load-bearing capacity of sea-ice and of its behaviour under flow conditions.
  (Principal investigators: R. Tinawi and J.R. Murat)
- Strength of prematurely frozen concrete and methods of damage assessment.
  (Principal investigator: J. Houde).

c) *Section: Transportation*

- Evaluation of design methods and maintenance techniques for northern highways.
  (Principal investigator up to 1984, J. Hode-Keyser). This project has been halted for the time being because of the death of the principal investigator, Mr. Hode-Keyser, in April 1984.

In mechanical engineering:

- Study of the behaviour and reliability of snowmobiles in the North.
  (Principal investigator: M. Gou).
- Effect of low temperatures on the behaviour of oil-hydraulic systems.
  (Principal investigator: H. Yelle).
- Domestic and industrial heat storage and its application in cold regions.
  (Principal investigator: E. Bilgen).

In metallurgical engineering:

- Study of the speed and mechanism of crack development in conditions of low-temperature fatigue.
  (Principal investigator: J.I. Dickson).

As noted above, the Centre's researchers have, for the purposes of these projects, used research stations and facilities of various institutions including those of DIAND at Inuvik and Igloolik. Some of them have also benefited from the Northern Scientific Training Program, administered by DIAND. This work has focussed on the northern environment and the behaviour of highways. However, during the last decade most of the Centre's infrastructure funds have taken the form of grants from the Research Training Program (FCAC) of the Québec Ministry of Education.

Organization of meetings

Since 1981, the Centre has been involved in the *organization of the following meetings:*

- in co-operation with Environment Canada: "Conference on the Northern Environment", Montréal, February 18-19, 1982.
- in co-operation with the Québec Association for Water Technology (AQTE), Environment Canada, Environment Québec, UQAM: "Conference on Acid Precipitation", UQAM, October 28-29, 1982.
- with the James Bay Power Corporation (SEBJ) and the McGill University Northern Studies and Research Centre: "Conference on Northern Housing", Radisson, Québec, March 22-25, 1982.
- "Annual conference of the Association of Canadian Universities for Northern Studies", École Polytechnique, May 4-7, 1982.
- "Construction in the Permafrost Regions", Journées Augustin-Frigon, October 18-19, 1984.

  A forthcoming conference, planned for 1986, will be on the subject of northern community planning.

Moreover, the Centre regularly organizes, in February or March of each year, one or more day-long information sessions on northern engineering, which include guest lectures, exhibitons and films on the North.

List of active principal investigators in northern research at the École Polytechnique

Name of Professor-Researcher	Department	Research Field
Bilgen, Ertugrul	Mechanical Engineering	Mechanical Engineering
Brière, François	Civil Engineering	Sanitary and Environmental Engineering
Delisle, Claude	Civil Engineering	Environmental Studies
Dickson, J. Ivan	Metallurgical Engineering	Metallurgical Engineering
Gou, Michel	Mechanical Engineering	Mechanical Engineering
Houde, Jules	Civil Engineering	Civil Engineering Construction
Labonté, Roger	Civil Engineering	Sanitary and Environmental Engineering
Ladanyi, Branko	Civil Engineering	Permafrost, Geotechnics, Snow and Ice, Soil Mechanics
Marche, Claude	Civil Engineering	Hydrology, Sanitary and Environmental Engineering
Murat, J. Robert	Civil Engineering	Construction, Snow and Ice, Ice
Tinawi, René	Civil Engineering	Construction, Snow and Ice, Ice
Yelle, Henri	Mechanical Engineering	Mechanical Engineering

Northern publications

"Rapport de la recherche 1982-1984", École Polytechnique de Montréal.

UNIVERSITY OF GUELPH
GUELPH, ONTARIO

General Information

University of Guelph, Guelph Ontario, N1G 2W1 (519-824-4120) has 9,794 full-time Undergraduates, 1,441 part-time Undergraduates, 938 full-time Graduate and 179 part-time Graduate students.

Its principal colleges (faculties) and centres are: Ontario Agricultural College, College of Arts, College of Biological Science, College of Family and Consumer Studies, College of Physical Science, Ontario Veterinary

College, University School of Rural Planning and Development, School of Part-Time Studies and Continuing Education, Animal Biotechnology Centre, Plant Biotechnology Centre, Equine Research Centre, Gerontology Research Centre.

Organization of Northern Studies

The University of Guelph does not have a special program of northern studies; however the Departments of Zoology, Land Resource Science, Family Studies, Sociology and Anthropology, and the University School of Rural Planning and Development have faculty with northern expertise and ongoing northern and native research programs. The University has participated since 1983 in the Northern Training Grant program of the Department of Indian and Northern Affairs. The contact person would be: Chairman, Northern Studies Committee, c/o Office of Research, University of Guelph.

Selected northern courses

Undergraduate Courses

Zoology

92-405	Natural Resources Policy
92-408	Wildlife Management
92-429	Marine Resources Utilization

Sociology & Anthropology

86-265	Prehistory of Canadian Native People
86-266	Contemporary Native Peoples of Canada

Land Resource Science

87-302	Soil Genesis and Classification

Geology and Geomorphology

46-205	Glacial Geology
46-250	Introduction to Remote Sensing
46-422	Periglacial Geomorphology
46-606	Periglacial Geomorphology

Graduate Courses

Zoology

92-613	Marine Mammal Ecology and Paleoecology
92-643	Advanced Wildlife Management

University School of Rural Planning and Development

95-635	Northern and Native Development and Planning

Land Resource Science

87-601	Soil Genesis and Classification

Distance Education

Guelph has an extensive program of "distance education" including several certificate programs. Many of the courses offered would be of potential interest to persons in the North. The contact is the Director, University School of Part-Time Studies and Continuing Education, University of Guelph.

Cooperative education

Some 17 coop programs are offered by the University including several in the agricultural sciences, child studies, family studies and food science which are probably unique in Canada. The University will take into account prior courses at other accredited institutions but does not give credit for prior work experience. The contact at Guelph is Mr. B.A. McCallum, Associate Director, Counselling and Student Resource Centre, University of Guelph.

Northern research

A list of projects funded in 1985/86 with relevance to the North forms Table 1. The main emphases in northern research at Guelph are in the biological and geological sciences as well as the emerging areas of community development and planning and land use planning. The University of Guelph has been a participant since 1983 in the Northern Training Grant program of the Department of Indian and Northern Affairs. Northern conferences organized by Guelph faculty in recent years include:

a) Research in Glacial, Glacio-fluvial and Glacio-lacustrine Systems, 6th Guelph Symposium on Geomorphology, 1980. Department of Geography.

b) Hudson—James Bay Symposium, April 1981. Department of Land Resource Science.

Northern scholars

An updated list of northern specialists at Guelph forms Table 2.

Native Studies

The University School of Rural Planning and Development graduate program has a specialty area in northern and native community planning and development. Students may also develop a joint program between the University School and a discipline. Students are expected to undertake an internship with a northern or native institution.

Table 1

Researcher	*Project Title*	*Sponsor Name*	*Award Amount*
T.D. Nudds	Community Ecology of Birds	NSERC Northern Supplement	5,000
	Community Ecology of Birds	NSERC Operating Grant	24,000
	Test whether the decline in population size of waterfowl since the 1960's is due to natality, increased mortality or some combination	Indian and Northern Affairs	3,040
J.C. Roff	Partitioning of energy resources between planktonic and benthic realms	NSERC Operating Grant	37,000
	Partitioning of energy resources between planktonic and benthic realms	NSERC Northern Supplement	4,000

	Determine the proportion of arctic phytoplankton primary production which is exported to the benthos during the open period	Indian and Northern Affairs	3,330
K. Ronald	Ecophysiology of Pinnipeds	NSERC Operating Grant	36,485
J.B. Sprague	Toxicity of pollutants to aquatic life	NSERC Operating Grant	30,051
V.G. Thomas	Critical body mass studies in breeding birds	NSERC Operating Grant	22,916
	Critical body mass studies in breeding birds	NSERC Northern Supplement	2,800
	Body energy reserves in the Collared Lemming (Dicrostonyx groenlandicus)	Indian and Northern Affairs	2,260
B.A. Wilson	The nutritional/fitness/genetic psychosocial aspects of impared glucose tolerance and diabetes mellitus in Dogrib Indians of the N.W.T.	Indian and Northern Affairs	2,120
J.R. Geraci	Factors underlying natural mortality in marine mammals	NSERC Operating Grant	36,039
	Factors underlying natural mortality in marine mammals	NSERC Northern Supplement	2,500
J.S. Wolfe	To assess the current status, need for and receptivity to community based planning and development in small, remote northern communities	Indian and Northern Affairs	3,280
S.G. Hilts	Impacts of all-terrain vehicle use on sub-arctic tundra, Cape Churchill Management Area, Manitoba	Indian and Northern Affairs	1,600
I.P. Martini	Quantitative studies of clastic sediments and rocks	NSERC Operating Grant	27,500
	Sedimentation of subarctic deltas as affected by river and sea-ice	NSERC Northern Supplement	6,000
	To monitor and analyze the processes associated with the spring break-up in the lower subarctic deltaic reaches of the Albany River	Indian and Northern Affairs	1,850
R. Protz	Rate of podzolic soil formation near southern James Bay	NSERC Operating Grant	21,415
H.S. Bayley	Body energy reserves in the Collared Lemming (Dicrostonyx groenlandicus)	Indian and Northern Affairs	2,260
S.A. Boutin	Experimental tests of hypotheses concerning mammalian population regulation	NSERC Operating Grant	20,000
	Comparison of mammalian population regulation mechanisms in northern versus southern regions	NSERC Northern Supplement	5,800
	To study the basic demography of a Muskrat (Ondatra zibethicus) population on Old Crow Flats, Yukon Territory	Indian and Northern Affairs	3,200
R.J. Brooks	Adaptive control of sex ratio in vertebrate populations	NSERC Operating Grant	35,000
	Adaptive control of sex ratio in vertebrate populations	NSERC Northern Supplement	6,500
G.L. Mackie	To assess the impact on benthic communities of winter pipeline construction across trout streams in the N.W.Territories	Indian and Northern Affairs	4,320

Table 2

Name	*Department*	*Location Code*	*Specialization Code*
D.W. Smith	Botany	12, 14	B.20, C.6, D.14
J.B. Sprague	Zoology	3, 14	B.1, B.8, K.5
S.A. Boutin	Zoology	12	B.4, B.8, B.21
J.C. Roff	Zoology	3, 18, 31	B.7, B.14, E.8, E.9
G.L. Mackie	Zoology	14	B.8
K. Ronald	Zoology	28, 34	B.22, E.6
T.D. Nodds	Zoology	14	B.8, B.18
V.G. Thomas	Zoology	17, 19, 21, 22	B.17, B.18, B.19, B.21
R.J. Brooks	Zoology	9, 22, 27	B.2, B.15
I.P. Martini	Land Resource Science	22, 31	C.11, C.21, F.7
S.G. Hilts	Land Resource Science	27	J.11
R. Protz	Land Resource Science	15, 22, 28, 31	B.7, C.19, D.13, F.7
J.R. Geraci	Pathology	29	B.19, E.5, E.6
B.A. Wilson	Human Biology	14	G.5
J.S. Wolfe	Rural Planning and Development	14, 28, 31, 34	J.11, J.18
J.F. Fitzgibbon	Rural Planning and Development	16, 28	C.6, C.14, C.18, J.11
J.H. Sabry	Family Studies	14	G.8

The codes refer to the publication "List of Northern Specialists at Canadian Universities/Liste des spécialistes du Nord dans les universités canadiennes", 2nd edition, 1983 (ACUNS Occasional Publication No. 8).

LAKEHEAD UNIVERSITY
THUNDER BAY, ONTARIO

General information

Enrollments

Lakehead University, Thunder Bay, Ontario P7B 5E1 (807-345-2121) has 3481 full-time undergraduates, 1576 part-time undergraduates, 144 full-time graduate students and 105 part-time graduate students.

Major faculties and professional schools with their departments are:

Faculty of Arts and Science

Anthropology, Biology, Chemistry, Economics, English, Fine Arts, Geography, Geology, History, Languages, Mathematics, Philosophy, Physics, Political Studies, Psychology, Social Work, Sociology.

Faculty of Professional Schools

Business, Engineering, Forestry, Library Technology, Nursing, Physical Education and Outdoor Recreation.

Faculty of Education

History and organization of Northern Studies

Because Lakehead University is located in the north a number of Departments have had a northern focus or conducted northern research since the inception of the University in 1965. These efforts, however, were not coordinated until 1984 when the President created a Committee on Northern Studies. The purpose of the Committee is to coordinate all matters relating to northern studies at the university and to make recommendations concerning the future of northern studies. The Committee recently submitted a report to the President that recommends Lakehead University significantly enhance its northern studies efforts by creating a Centre for Northern Studies that would place particular emphasis on northwestern Ontario and the northern regions of the other provinces.

The Presidential Advisory Committee on Northern Studies has five members and is chaired by the Vice-President (Academic). A part-time administrative assistant attached to the office of the Vice-President assists the Northern Studies Committee. For further information contact:

Geoffrey R. Weller
Vice-President (Academic)
Lakehead University
Thunder Bay, Ontario, P7B 5E1

Facilities for Northern Studies

At present Lakehead University does not offer either undergraduate or graduate degrees in northern studies although some of the discipline based graduate programs, such as that in Sociology, have a northern regional focus. The Northern Studies Committee has recommended that both undergraduate and graduate interdisciplinary degree programs in northern studies be instituted in the near future.

Perhaps the major facility supporting those who conduct northern research or who teach courses on northern topics is the Northern Studies Collection in the Chancellor Paterson Library. In 1982, with help from the Social Sciences and Humanities Research Council, Lakehead University established the position of Northern and Regional Studies Librarian. This research Librarian has helped develop a collection of materials on the Canadian Provincial North with emphasis on Northwestern Ontario. The Northern and Regional Studies Database presently lists over 18,000 items of which approximately 5,000 deal with northern Ontario. A Forestry Theses subset has been set up for the School of Forestry and a manual has been prepared for searching it. The specialised Librarian also provides both general and specialised reference/information services to the faculty, staff and students who are engaged in northern research.

The other major facility supporting those who conduct northern research is our location in the north. We have no need for a northern field station or, to put it another way, Lakehead is located in its field station — northwestern Ontario. The University owns several quite extensive tracts of land in the region which are used largely by the School of Forestry for various instructional and research purposes and are also occasionally used by other Departments and Schools.

Northern courses

Because Lakehead University is situated in northern Ontario a great many courses and, indeed, entire departments and programs have a northern focus or a northern component to much of what they do. This is most obviously the case in those departments where field work is involved as in the examples of Geology, Geography, Biology, Outdoor Recreation, Anthropology (Archaeology), and Forestry. It is also clearly the case in those Departments that have strong ties to the communities in our northern region as in the examples of Social Work, Nursing, Education and Business. It is perhaps less obvious in other areas because course titles do not reveal the northern focus that naturally results from our location. For example, the course on Ontario History emphasises the history of northern Ontario. Because of this, relatively few of our courses will have the word "north" in their titles although there are some undergraduate ones that do such as Political Studies 4203 "Politics in the Canadian North" and some graduate ones that do such as Sociology 5311 "Sociology of Northwestern Ontario."

Teaching and Distance Education in the North

All of Lakehead University's teaching is done in the north. Most, of course, is done at our campus in Thunder Bay but courses are offered throughout northwestern Ontario. The region served by Lakehead is, in fact, considerably bigger than the regions served by all of the other universities in Ontario combined for with a land area of 523,000 sq. km., it constitutes 57% of the entire province. Lakehead University permanently serves, with courses for credit, 17 communities throughout the region and has served up to 22 communities at one time. The furthest centre is 700 km. from our campus and the average distance to our off-campus centres is 366 km. Most of these off-campus offerings to date have been traditional courses from the Arts and Teacher Education areas, but a special Nursing program is being offered in Kenora and Business courses have been given in several communities.

Lakehead University is currently reorganizing such that a greater emphasis can be placed on its off-campus operations and greater use made of new technology. At present most off-campus courses are taught by full-time faculty and are given on the weekends or on a bi-weekly basis. This necessitates extensive travel by faculty members over vast distances often in difficult weather conditions. Student support services include course and program counselling, as well as extensive library 'travelling collections' and a toll free/priority post service operated by the Chancellor Paterson Library. Most regional libraries have the complete Lakehead University card catalogue on microfiche. While these modes of operation and services will be retained it is hoped they can be supplemented by various new technologies to enhance their effectiveness and added to in a way that will enable Lakehead to reach the smaller and more remote communities in its region.

Special credit arrangements and co-op programs

Lakehead University follows the policy of College to University transfer of credits established by the Ontario Universities Council on Admission. This policy is that three year College graduates with a B average be admitted with advanced standing to a maximum of 5 full courses and that two year College graduates with a B average be admitted to Year 1 of degree studies without advanced credit. College graduates who complete the first year of a program with at least an A average and are recommended by a college counsellor could be admitted to the first year of a degree program on probation. Three year College graduates with a suitable background are admitted directly into the third year of the Bachelor of Administration degree program and into a two year Engineering degree program which is preceded by summer study. Lakehead University does not offer credit for work experience and does not operate any co-op programs.

Northern research

Introduction

Because Lakehead is situated in one of the northern geographical areas as defined by the Association of Canadian Universities for Northern Studies and because the university has the responsibility to gather knowledge about the region, its northern related research is extensive. Much of it relates to Lakehead's immediate region, northwestern Ontario, but some of it relates to similar regions elsewhere in Canada such as northern Manitoba, Quebec and Saskatchewan as well as to similar regions in other countries such as northern Sweden, northern Finland and northern Norway. In addition, there is some research undertaken in and on far northern regions such as the Yukon and Northwest Territories. Given the very large amount of research undertaken it is only possible to highlight some of it in this document. The northern related publications of members of the Humanities and Social Sciences Departments at Lakehead are listed in a booklet that can be obtained from the Vice-President (Academic), detailed listings for other Departments can be obtained either from the Northern and Regional Studies Database at the Chancellor Paterson Library or by contacting the chairman of the relevant Departments and Schools. The following information by sector is merely intended to be suggestive of the range of northern research being conducted.

Social Sciences

Members of the Department of *Economics* have published numerous studies on northern regional economic problems, such as transportation, and performed major studies for Royal Commissions, such as the Royal Commission on the Northern Environment (Fahlgren Commission), on subjects such as forest resource development. Members of the Department of *Anthropology* are responsible for several books and a large number of articles on the native population of northern Ontario as well as for conducting archeological excavations in the region. The Masters program in *Sociology* has as its special mandate the theme "Social Change and Northern Development" so, naturally, most of its theses and much of the research performed by its faculty members are northern in orientation. The subject matter ranges from the extension of telecommunications to Native Communities and the image of Natives in Ontario schools textbooks to the impact of the Hemlo gold development on the town of Marathon. Members of the Department of *Political Studies* have produced studies on the politics in northern hinterland regions, provincial Ministries of Northern Affairs, local government in the Canadian provincial north, health care delivery in northern regions and numerous other topics, including a comparison of the University systems of northern Sweden and northern Ontario. Members of the *Geography* Department conduct research on the human impact of northern weather and climate and on glacial and coastal geomorphology. The Department of *Social Work* has been involved in research on topics such as the transition counselling services provided to unemployed workers in Atikokan following the mines closure.

Humanities

Members of the Department of *History* have produced studies on the history of the development of northwestern Ontario and the City of Thunder Bay. The Department of *Languages* has developed for Bell Canada an "appropriate" telephone directory format for Native Communities. Members of the *English* department have published poems with a northern theme and studied "northern" authors.

Sciences

In the *Biology* department a major effort is under way with the support grant of nearly $400,000 from the Ministry of the Environment on the effect of Acid Rain on northwestern Ontario. A five year program is also underway in that department into the ways in which wild rice can be commercially exploited. Many of the members of the department are engaged in studies of the animal and plant species of northwestern Ontario and other regions. An interdisciplinary project involving Biology and *Chemistry* relates to a long-term study of the aquatic toxicology of organic chemicals. Members of the *Geology* department conduct structural geological research throughout the region of northwestern Ontario and in Arctic regions. Two members of the Department have worked for many years on a detailed analysis of the Coldwell Alkaline Complex and there has been an extensive project involving the stratigraphy and geochronology of the Quaternary sediments of the Great Lakes.

Forestry

The level of research support has grown dramatically in the School of Forestry in recent years both in terms of NSERC support and major grants and contracts. For example, major grants support a study of the genetic improvement of a specific tree, the establishment of a computer based resource information system (CARIS) and the development of a prototype small scale forest residue harvesting machine. Several contracts are also being carried out for the Ontario Ministry of Natural Resources dealing with nursery stock improvement and growth and yield studies. All of these efforts are directly related to the Boreal Forest region in which the School is located.

Engineering

Several members of the School of Engineering are engaged in northern related research on subjects such as drilling in the permafrost in Alaska with a sonic drill, the permafrost and mechanical properties of Ice Hovercraft transportation applications and designs, and shallow soil movements in Yellowknife.

Physical Education and Outdoor Recreation

Many activities of this school are tied to northern regional interests and problems. Scientific studies dealing with the evaluation and assessment of national team athletes at the National Ski Training facility in Thunder Bay are underway. In Outdoor Recreation policy studies related to wilderness park usage are being conducted as well as studies of park planning and the resolution of land use conflicts. An assessment of commercial tourism alternatives in northern Ontario is also being undertaken.

Business

The School of Business has undertaken a number of studies on businesses in northwestern Ontario and operates the Small Business Assistance Program which provides expert consulting services to businesses in northwestern Ontario.

Education

A great deal of northern research is conducted by members of the Faculty of Education. Books have been published on Indian and Inuit literature and an Ojibwe language textbook is being developed. Studies have been completed or are in progress on topics ranging from northern curriculum development, native education and distance education techniques to program delivery strategies used by small secondary schools in northern Ontario.

Other northern activities

Lakehead University participates in a number of activities related to northern studies among them being DINA's Northern Scientific Training Program, various conferences and Innovation North.

Northern Scientific Training Program

Lakehead University participates in the Northern Scientific Training Program. Last year Lakehead University students went to Muskrat Dam in far northern Ontario to conduct an analysis of leadership style in an Indian Community and to conduct a study of the service delivery system for Native elderly citizens. In addition a student went to Bluefish Lake in the NWT to conduct experiments on soil movements.

Conferences

Lakehead University has hosted a number of northern conferences and plans to host more in the future. Among the most notable conferences hosted recently have been the ACUNS sponsored International Symposium on the Dynamics of Boreal Forest Ecosystems and the Western Association of Sociology and Anthropology's conference on Social Relations in Resource Hinterlands. The first conference brought together scholars from many nations and resulted in the publication R.W. Wein, R.R. Riewe and I.R. Methven, *Resources and Dynamics of the Boreal Zone*, Ottawa: A.C.U.N.S., 1983. The second conference brought together speakers from across Canada who dealt with many of the problems faced by northern resource hinterland areas like northern Ontario. Lakehead University is currently organising a conference to be entitled Northern Hinterlands: Problems and Potential which will compare the nature of the problems and the potentials of the northern hinterland regions of Ontario and Minnesota and possibly the Upper Peninsula of Michigan.

Innovation North

Lakehead University has recently established Innovation North, an Innovation Centre that is part of the Government of Ontario's province-wide program for the establishment of such centres. The purpose of Innovation North is to encourage the commercialization of innovation and technology through the availability of business advice, counselling and services to post-secondary school entrepreneurs, and through the marketing of university resources to the private sector so that industry may develop new ideas, products and processes. Innovation North is a joint venture by both Lakehead and Laurentian Universities which has two offices but one governing body.

Native Studies

Lakehead University is located in a region with a significant and increasing proportion of Native Canadians. Roughly 10% of the regional population is of Native ancestry. It is not surprising, therefore, that Native Studies is an important and growing part of the University's activities.

The Faculty of Education offers two significant programs. One is the Native Teacher Education Program (NTEP). This is a two year diploma program that prepares Native students to teach at the elementary level and involves approximately 25 full time participants. A significant amount of Northern content is included in the program as many of its graduates return to northern communities to live and work. It provides for instruction in Native studies as well as Education and, after successful completion of the diploma, graduates are recommended to the Ministry of Education for the Ontario Teacher's Certificate (Primary/Junior Division). The second program offered by the Faculty of Education is the Native Language Instructors Program (NLIP). This instructs participants in Native language teaching techniques and involves approximately 60 full time and 20 part time students in 3 areas of specialisation, namely Native as a First Language, Native as a Second Language, Native Language Teacher Certification. The diplomas involve 4 summers of course work and two practica taken in the field in winter.

The Department of Anthropology offers four half courses related to Native Studies (Native People and the Past, Native People and Government, Native People and the Land, Native People and the Issues). The Department of Languages and the Faculty of Education cooperate in offering courses in Cree, Ojibway, Algonkian and Iroquois. The Faculty of Education offers courses in North American Indian Literary Studies, Native Arts and Crafts and Curriculum Development for Native Schools. A number of other courses, such as Politics in the Canadian North offered by the Department of Political Studies, also deal, in part, with Native issues.

The School of Nursing is currently planning a program for Natives in Nursing. The School has conducted a consultation conference with native and government leaders to determine needs and has formed a working party to institute the program. Both Native and northern health needs will be integrated throughout the program. The Department of Social Work is actively pursuing the possibility of instituting a program in Native Social Work.

As there are a growing number of Native students on campus taking a wider range of programs the Northern Studies Committee at Lakehead has recently recommended that the number of services provided to Native students be increased in terms of items such as counselling, financial aid, accommodation and special programs. The committee also recommended that the University enhance its capacity to deliver off-campus courses deliberately targetted at and appropriate for Native residents throughout the region of northwestern Ontario.

Northern specialists at Lakehead

Name	*Department*	*Specialization*	*Northern Region*
Akervall, H.	Outdoor Rec.	Special Populations	Northern Ontario
Anderson, F.	Economics	Resource Econ. Forestry	Northern Ontario
Arthur, E.	History	Northwestern Ont.	Northern Ontario
Barclay, P.	Biology	Boreal Ecology	Boreal
Bates, D.	Education	Native Education	Northern Ontario
Benson, C.	Forestry	Forest Management	Boreal
Bonsor, N.	Economics	Transportation/Forestry	Northern Ontario
Borradaile, G.	Geology	Structural Geology	Northern Ontario/Arctic
Brown, K.	Forestry	Growth and Yield	Boreal
Carmean, W.	Forestry	Soil Classification	Boreal
Clarke, R.	Forestry	Silviculture	Boreal
Christie, R.	Outdoor Rec.	Tourism	Northern Ontario
Cloutier, A.	Languages	French Culture in Northern Ontario	Northern Ontario
Cumming, H.	Forestry	Wildlife Management	Boreal
Dawson, K.	Anthropology	Archeology	Northern Ontario
Delaney, R.	Social Work	Child Welfare	Northern Ontario
Driben, P.	Anthropology	Native Studies	Northern Ontario
Eiber, T.	Forestry	Fire Management	Boreal
Eigenbrod, D.	Engineering	Geotechnical Engineering	N.W.T.
Epp, E.	History	Business History	Northern Ontario
Farmer, R.	Forestry	Ecology/Genetics	Boreal
Hanna, J.W.	Outdoor Rec.	Interpretation	Northern Ontario
Hazenburg, G.	Forestry	Forest Economics	Boreal
Kayll, A.	Forestry	Fire Ecology	Boreal
Kehlenbeck, M.	Geology	Structural Geology	Northern Ontario
Kelley, M.L.	Social Work	Northern Soc. Work/Aging/Alcoholism	Northern Ontario
Kemp, D.	Geography	Human Impact of Weather & Climate	Northern Ontario
Kissin, S.	Geology	Mineral Deposits	Northern Ontario

Knowles, P.	Biology	Genecology	Boreal
Korteweg, L.	Education	Small Secondary Schools	Northern Ontario
Lankester, M.	Biology	Parasitology	Boreal
Lee, P.	Biology	Wetlands Ecology	Boreal
Linklater, H.	Education	Northern Curriculum	Northern Ontario
McBride, S.	Political Studies	Forest Industry	Northern Ontario
McDougall, L.	Nursing	Community Health and Gerontology	Northern Ontario
McKay, S.	Social Work	Social Impact of Industry Closures	Northern Ontario
Martin, D.	Sociology	Finnish Culture	Northern Ontario/Finland
Miller, T.	History	Political History	Northern Ontario
Minore, J.	Sociology	Telecommunication	Northern Ontario
Mitchell, M.L.	Education/Languages	Native Language Education	Northern Ontario
Mitchell, R.	Geology	Igneous Petrology/Geochemistry	Northern Ontario/NWT
Momot, W.	Biology	Fish Biology	Boreal
Muirhead, B.	History	Single Industry Towns/Mine Closure	Northern Ontario
Murchison, G.	Forestry	Biometrics	Boreal
Nabarra, A.	Languages	French Exploration and Settlement	Northern Ontario
Nelson, C.	Social Work	Community Devel./Indian Soc. Services	Northern Ontario
Nock, D.	Sociology	Sociology of Religion/Education	Northern Ontario
North, H.	Engineering	Transportation/Ice Hovercraft	N.W.T.
Pakulak, D.	Continuing Education	Continuing Education	Northern Ontario
Parker, W.	Forestry	Genetics	Boreal
Petrone, S.	Education	Indian and Inuit Literature	Northern Canada and Alaska
Phillips, B.	Geography	Glacial and Coastal Geomorphology	Northern Ontario
Platt, R.	Geology	Igneous Petrology/Geochemistry	Northern Ontario/N.W.T.
Power, D.F.	Education	Multiculturalism	Northern Ontario
Richardson, D.	Forestry	Mensuration	Boreal
Rollins, R.	Outdoor Rec.	Park Planning	Northern Ontario
Rosehart, R.G.	President/Engineering	Single Industry Towns/Pulp & Paper	Northern Ontario
Rutledge, D.	Nursing	Pediatrics and Primary Care	Arctic
Ryder, J.	Biology	Sociobiology	Arctic/Biology
Setliff, E.	Forestry	Pathology	Boreal
Seyffert, H.	Languages	Native Languages	Northern Ontario
Smith, V.C.	History	Forest Industry	Northern Ontario
Smithers, J.	Outdoor Rec.	Tourism/Historical Expeditions	Northern Ontario
Stafford, J.	Sociology	Demography	Northern Ontario
Tanz, J.S.	Forestry	Forest Management/Photogrammetry	Boreal
Thompson, L.A.	Outdoor Rec.	Organization & Administration	Northern Ontario
Walker, H.	Forestry	Operations Research	Boreal
Wawia, D.	Education	Native Education	Northern Ontario
Weller, G.R.	V.P. (Academic) Pol. Studies	Politics/Health Care	All Northern Regions
Westbroek, H.	Forestry	Remote Sensing	Boreal
Yang, K.C.	Forestry	Wood Technology	Boreal
Zingel, S.	Forestry	Soils	Boreal

Selected northern references

The following are just a few references to provide an indication of the range of northern related publications that have been produced by faculty members at Lakehead University. If further information is required the Northern and Regional Studies Database at the Chancellor Paterson Library should be consulted. A list of all of the northern related publications of members of the Humanities and Social Science Departments is available from the Vice-President (Academic).

S.P. Petrone, First People, First Voices, Toronto: University of Toronto Press, 1983.

P. Driben and R.S. Trudeau, When Freedom is Lost: The Dark Side of the Relationship Between Government and the Fort Hope Band, Toronto: University of Toronto Press, 1983.

N.C. Bonsor, Transportation Rates and Economic Development in Northern Ontario, Toronto: University of Toronto Press, 1977.

Geoffrey R. Weller, "Managing Canada's North: The Case of the Provincial North" Canadian Public Administration, Vol. 27, No. 2 (Summer 1984), pp 197-209.

W.I. Momot, "Production and Exploitation of Crayfish in Northern Climates" Canadian Journal of Fisheries and Aquatic Science 1985 (In Press).

B.C. Jago and R.H. Mitchell, "Minerology and Petrology of the Ham Kimberlite, Somerset Island N.W.T." Canadian Minerologist, 1985 (In Press).

D.D. Kemp, "Quantification of Descriptive Weather Records: An Example from the Canadian Fur Trade" Weather Vol. 39 (1984) pp. 330-334.

F.J. Anderson and N.C. Bonsor, The Economic Future of the Forest Products Industry in Northern Ontario, Toronto: Royal Commission on the Northern Environment, 1981, 227 pp.

K.C.A. Dawson, "The MacGillivray Site: A Laurel Tradition Site in Northwestern Ontario" Ontario Archeology, Vol. 33, 1982, pp. 45-68.

M.E. Arthur, Thunder Bay, 1821-1892: A Collection of Documents, Toronto: University of Toronto Press, 1973, 307 pp.

T. Miller "Cabin Fever: The Province of Ontario and Its North" in Donald C. MacDonald (ed), The Government and Politics of Ontario, Toronto: Van Nostrand 1980 (2nd Edition) pp 227-244.

J.D. Martin, "Folk Technology Retention: Finnish Folk Tools and Procedures in Mid-Canada and Central Finland" Scandinavian Studies Vol. 1 1983, pp 35-48.

D. Eigenbrod, "Application of Geomembranes in Northern Canada" International conference on Geomembranes, Denver, Proceedings 1984, pp 429-434.

G.J. O'Reilly, W.H. Parker and W.M. Cheliak, "Isozyme differentiation of upland and lowland *Picea Mariana* Stands in Northern Ontario" Sivae Genetica (1985) In press.

M. Bray and E. Epp (eds), A Vast and Magnificent Land: An Illustrated History of Northern Ontario, Thunder Bay and Sudbury: Lakehead University and Laurentian University, 1984 (A Bicentennial Project of the Ontario Ministry of Northern Affairs).

LAURENTIAN UNIVERSITY/UNIVERSITÉ LAURENTIENNE
SUDBURY, ONTARIO

General information

Laurentian University, Sudbury, Ontario P3E 2C6 (705-675-1151), has 2684 full-time undergraduates, 2331 part-time undergraduates, 94 full-time and 89 part-time graduate students (1982-83 statistics). Federated universities are Huntington University, University of Sudbury and Thorneloe University, affiliated colleges are Algoma University College, Le Collège universitaire de Hearst and Nipissing University College. Laurentian is an officially bilingual university. Its faculties are Humanities, Professional Schools, Science and Engineering and Social Science. Its principal schools are Commerce and Administration, Engineering, Graduate Studies, Nursing, Physical and Health Education, Social Work and Translators and Interpreters.

Northern research and teaching by faculty

Humanities

English / Anglais

Flood, John (Collège Universitaire de Hearst), Northern Ontario literature; book (Penumbra Press) and periodical (*Northward Journal*) publisher

Course Offerings:
ENGL 2456/7: Northern Ontario Literature

Folklore / Folklore

Pichette, Jean-Pierre, (Université de Sudbury), Littérature orale du Canada français

Course Offerings:
FOLK 1126F: Littérature orale au Canada français
FOLK 3126F: Les folklores du Canada

Français / French

Dickson, Robert, (Laurentian), Littérature et culture canadiennes-françaises; littérature et culture franco-Ontariennes; publication, diffusion et réception de la littérature

Course Offerings:
FRAN 1737F: Littérature et culture au Canada français

Modern Languages / Langues modernes

Lewis, Gertrud Jaron, (Laurentian), German Communities in Northern Ontario

Native Studies / Etudes amérindiennes

Alcoze, Tom, (Université de Sudbury), Canadian Native People

Hall, Tony, (Université de Sudbury), Canadian Native People

Course Offerings:
All Courses offered by the Department of Native Studies are relevant.

Philosophy / Philosophie

Cragg, Wes, (Laurentian), Applied Ethics

di Norcia, Vince, (Université de Sudbury), Social and Political Philosophy, Business and Professional Ethics

Course Offerings:
PHIL 2815E: Social and Political Philosophy
PHIL 2875E: Business and Professional Ethics

Social Sciences

Anthropology / Anthropologie

Devereux, Helen, (Laurentian),

Molohan, Kathy, (Laurentian),

Course Offerings:
ANTR 2035E: Ethnology of North American Native Peoples
ANTR 2055E: Native Canadians: Heritage and Issues (Algoma)
ANTR 2055F: Ethnologie des communautés canadiennes-françaises
ANTR 2065E: The Archaeology of Ontario in a North American Setting

Economics / Science économique

Cook, Rupert, (Laurentian), Transport Economics

Strauss, Hans, (Laurentian), Mining Economics

Willauer, Ed, (Laurentian), Mining Economics

Course Offerings:
ECON 2156E: Mineral Economics
ECON 3025E: Economic Development of Canada
ECON 3055E: Economics of Transport

Geography/Géographie

Brozowski, Roman, (Nipissing), Geography of Northern Ontario

Ewing, Bob, (Algoma), Tourism and Development in Northern Ontario

Konarek, Joe, (Laurentian), Arctic and Subarctic Studies

Martin, Jean-Pierre, (Laurentian), Demography and Ethnicity of Northern Ontario

Martin-Guillerm, M., (Laurentian), Demography and Ethnicity of Northern Ontario

McLarty, Ken, (Algoma), Social Services and Education in Remote Areas

Pitblado, Roger, (Laurentian), Geomorphology; Acid Rain; Remote Sensing

Saarinen, Oiva, (Laurentian), Urban Geography of Canada; Northern Ontario Studies; Ethnic Migrations

Rees, David, (Nipissing), Geography of Northern Ontario

Tapper, Gerald, (Laurentian), Physical Geography of Canada; Remote Sensing; Climatology; Ethnic Migrations

Topps, Keith, (Nipissing), Geography of Northern Ontario

Course Offerings:
GEOG 2405F: Géographie du Canada
GEOG 2406 7E: Socio-Economic and Economic Geography of Canada
GEOG 3036E: Air Photo Interpretation
GEOG 3037E: Remote Sensing of the Environment
GEOG 3237E: A Political Geography of Canada
GEOG 3496 7E: Canada's Hinterlands, Northern Hinterlands
GEOG 3495F: Le développement régional dans les milieux nordiques
GEOG 3505E: The Canadian Shield (Algoma)
GEOG 4805E: Natural Resource Development in Regional Planning
GEOG 4817E: Urban Land Use Planning in Canada

History/Histoire

Abbott, John, (Algoma), Education in Northern Ontario

Best, Henry, (Laurentian), History of Quebec

Bray, Matt, (Laurentian), Canadian Business History; History of Northern Ontario; History of the Canadian West

Brown, Ian, (Algoma), Northern Ontario History

Gervais, Gaetan, (Laurentian), Histoire du Nord Ontario; histoire des franco-ontariens; histoire du Québec; histoire des entreprises au Canada

Gilbert, Angus, (Laurentian), Ontario History; History of Northern Ontario

Mount, Graeme, (Laurentian), Canada-Greenland Relations, History of Northern Ontario

Surtees, Bob, (Nipissing), History of Northern Ontario; History of Canadian Native Peoples

Toupin, Robert, (Laurentian), L'histoire des Indiens

Wallace, Carl, (Laurentian), History of Northern Ontario; Canadian Urban History; Labour History of Canada

Course Offerings:
HIST 3066E: Communities in Canada: An Historical Perspective
HIST 3216E: The Canadian Indian in Historical Perspective
HIST 3216F: L'histoire des Indiens dans le contexte canadien
HIST 3246E: History of Quebec Since 1867
HIST 3246F: Histoire du Québec depuis 1867
HIST 3256E: History of Ontario
HIST 3256F: Histoire de l'Ontario
HIST 3266E: The Canadian West
HIST 3276E: History of Northern Ontario
HIST 3276F: Histoire du Nord-Ontario
HIST 4275E: Ontario History
HIST 4275F: Histoire de l'Ontario
HIST 4285E: Northern Ontario: Selected Topics
HIST 4285F: Le Nord-Ontario: choix de thèmes

Law and Justice/Droit et Justice

Cragg, Wes, (Laurentian), Canadian Law; Corrections

Neff, Charlotte, (Laurentian), Canadian Law

Course Offerings:
JURI 2206 7E: Introduction to Canadian Law
JURI 2206 7F: Introduction au droit canadien
JURI 2306E: The Law of Buying, Selling and Insuring
JURI 2406E: Persons and the Law

Political Science/Science politique

Dyck, Rand, (Laurentian), Provincial and Municipal Politics; Politics of Northern Ontario

Havel, Jean, (Laurentian), La politique du Nord-Ontario; Political Behavior

Segsworth, Bob, (Laurentian), Political Behavior; Canadian Public Administration

Course Offerings:
POLI 3705E: Provincial and Municipal Government
POLI 3705F: Gouvernement provincial et municipal

Sociology/Sociologie

Ribordy, François, (Laurentian), Legal Systems of Northern Ontario

Course Offerings:
SOCI 3035E: Sociology of Labour and Labour Movements
SOCI 3035F: Les mouvements ouvriers
SOCI 3095E: Canadian Society
SOCI 3095F: Société canadienne

Sciences

There is a considerable focus on Mining in Laurentian's Faculty of Science and Engineering. An Index of Mining and Mineral Related Research is available from the Dean's office. It includes entries involving Geology of various parts of the Arctic and Subarctic, mining studies in Mechanical Engineering, Physics and Chemistry and applied biological studies. An Index of Mining and Mineral Related Research at Laurentian, 1986, can be obtained from the Faculty of Science.

Biology/Biologie

Alikhan, M.A., (Laurentian), Effects of toxic metals on crayfish in Northern Ontario

Anthony, D., (Nipissing), Environmental Studies of Northeastern Ontario

Beckett, Peter, (Laurentian), Plant ecology with a special interest in moss and wetland ecology; the use of plants and macrofungi as biogeochemical prospecting tools

Clulow, F.V., (Laurentian), Mammalian ecology, working on the radionuclide uptake in muskrats and other rodents living near mine wastes in Northern Ontario

Courtin, G.M., (Laurentian), Alpine and arctic plant ecophysiology; ecophysiology of the trees of the industrially-stressed birch-maple ecosystem in the Sudbury, Ontario area

Ferroni, G.D., (Laurentian), Microbiology, working on psychrophilic bacteria in Northern Ontario

Leduc, L.G., (Laurentian), Microbiology, working on psychrophilic bacteria in Northern Ontario

Mallory, F.F., (Laurentian), Genetics, population dynamics and ecology of boreal and arctic mammals

Morris, J.R., (Laurentian), Freshwater Biology, working on the effects of acidification and metal contamination of lakes and streams on aquatic life

Parker, G.H., (Laurentian), Physiology of cold stress in vertebrates, working on the environmental toxicology, especially toxic metal stress, in Northern Ontario

Shorthouse, J.D., (Laurentian), Entomology, working on insect gall ecology and morphogensis

Sorensen, Linda, (Algoma), Animal Behavior, viz. wolves

Watts, P.D., (Laurentian), Ecophysiology of the polar bear and other arctic mammals, working at the Institute of Arctic Ecophysiology at Churchill, Manitoba.

Winterhalder, K., (Laurentian), Plant Ecology specializing in plant-soil relationships and soil biology; revegetation of the industrial barrens of the Sudbury area in Northern Ontario

Course Offerings:
Most of the courses offered by the Department of Biology are directly relevant to Northern studies.

BIOL 1000E: Canadian Environmental Biology

Chemistry/Chimie

Westaway, Ken, (Laurentian), Pollutants in Diesel Exhaust in Underground Mines

Geology/Géologie

Beswick, Tony, (Laurentian), Igneous and metamorphic history of greenstone belts in Northern Ontario

Cameron, Bob, (Laurentian), Economic geology of the Abitibi Greenstone Belt

Copper, Paul, (Laurentian), Silurian brachipods and corals in Hudson Bay Lowlands, Southhampton Island, Timiskaming Rift and Lake St. John, and Anticosti Island

Davies, J.F., (Laurentian), Economic Geology of the Abitibi Greenstone Belt

Goff, S., (Laurentian), Igneous and metamorphic history of greenstone belts in Northern Ontario

James, R.S., (Laurentian), Igneous and metamorphic history of greenstone belts in Northern Ontario

Long, D.G.F., (Laurentian), Sedimentology of Proterozoic and early Paleozoic sequences on Ellesmere Island, Brock Peninsula, Mackenzie Mountains, Northern Ontario and Quebec; coal deposits in the Yukon, and Hudson Bay platform.

Whitehead, R., (Laurentian), Economic geology of the Abitibi Greenstone Belt

Course Offerings:
All courses offered by the Department of Geology are relevant.

Professional Schools

Commerce/Commerce

Cotton, G.B., (Laurentian), Technology Strategy and Marketing Strategy; International Business; Entrepreneurial Development; Developments in Distance Education

Loucks, Ken, (Laurentian), Entrepreneurship Development for Business Creation in Developing Countries

Human Movement/Mouvement humaine

Sidney, Ken, (Laurentian), Cold Weather Activities

Rogers, Bob, (Laurentian), Cold Weather Activities

Social Work/Service social

Minor, Kathleen, (Laurentian), Counselling in Inuit Society

Projects relating to Northern Studies

1. The Gardner Northern Collection
Le Centre du Nord Gardner

The Gardner Northern Collection comprises more than 1,700 books, 500 pamphlets and 65,000 press clippings relating to northern Canada. The press clippings cover the period 1930 - 1968, and most of them are catalogued, the catalogues being available for distribution. The collection also contains 6,289 photographs, as well as rock, soil and plant specimens. Of particular interest are the 4,410 wood disks collected over a wide range of latitude and habitat in Northern Quebec and Labrador.

A name change is currently being negotiated, by which the Collection will become the Gardner Northern Research Centre. It is hoped that the Centre will then become a focal point for all research on the Canadian North at Laurentian University.

2. Institut Franco-Ontarien and *Revue de Nouvel Ontario*

The Institut franco-ontarien possesses a collection of material on Franco-ontariens, which may be consulted by the general public. It publishes the *Revue du Nouvel-Ontario* and members play a leading role in the organization of conferences relating to the Franco-ontarien population.

3. Laurentian University Review Revue de l'Université Laurentienne

The *Laurentian University Review* is a bilingual, scholarly journal published twice yearly under the general editorship of Professor Robert Toupin of the Department of History. Though its overall focus is the interdisciplinary approach and Canadian studies, in recent years it has been oriented more to Northeastern Ontario. Special issues of note include "Northern Ontario: Environmental Perspectives" edited by J. Roger Pitblado, Vol. XVI, No. 2, February, 1984; and "City Government in Northern Ontario" edited by Carl Wallace, Vol. XVII, No. 2, February, 1985.

4. The Language Centre Centre des Langues

Inaugurated in 1982, the Language Centre is primarily responsible for first and second (English and French) language testing of incoming students to Laurentian University. The Centre also provides remedial language assistance in both languages to students who have demonstrable linguistic difficulties.

5. Northern Literary Symposium

Since 1983 the English departments of the Laurentian University system (Algoma University College in Sault Ste Marie, Nipissing University in North Bay, le Collège de Hearst in Hearst and Laurentian University in Sudbury) have met annually at one of the four campuses to share the results of their research on a particular topic. More recently symposium organizers have invited the participation of the English department of Lakehead University in these proceedings.

6. The Centre in Mining and Mineral Exploration Research (CIMMER)

The Centre in Mining and Mineral Exploration Research (CIMMER) is a multi-disciplinary research endeavor whose research interests are focussed on the mining sector. Groups of faculty have been established around four major themes geobotany, hard-rock robotics mining, environmental rehabilitation and health and safety concerns. Research in these areas is now under way, and interaction with industry and government agents occurs on a continuing basis. By definition, CIMMER is focussed on the major industrial and mining needs of Northern Ontario.

7. Northeastern Ontario Labour Industrial Archives (NOLIA)

The Northeastern Ontario Labour-Industrial Archives was created as part of the Laurentian University Library in 1980. Instrumental in its establishment was Professor Henry Radecki of the Department of Sociology who has since left the university. The Archives contains taped interviews with local labour leaders, company and union materials and private collections donated by such individuals as Robert Carlin, James Tester and Michael Solski.

8. Northeastern Ontario Collection

Since the founding of Laurentian University an effort has been made to collect materials, primary and secondary, relating to the people and communities of Northeastern Ontario. These materials are to be found on the seventh floor of the Library in the Northeastern Ontario Collection. Because of their unique nature, they are for reference only and may not be removed from the library.

Native Studies

The Department of Native Studies (Département d'études amérindiennes) offers a B.A. degree in the General (3 year) program which involves a concentration of six Native Studies courses in a 15-course degree.

Courses offered include Canadian Native People, introductory and advanced Cree and Ojibwa, La religion des Amérindiennes du Canada, Contemporary Native Issues, Native Arts, Native People and Canadian Law, etc.

For further information write the Chairman of Native Studies.

Distance Education

This topic is covered in the Distance Education section of this volume (article by Croft).

UNIVERSITÉ LAVAL
QUÉBEC, QUÉBEC

Adresse: Cité universitaire, Québec (Québec) G1K 7P4
Téléphone: (418) 656-2131
Télex: 05131621

Inscriptions (1983-1984):

1^{er} cycle à temps plein:	16,559
1^{er} cycle à temps partiel:	7,020
2^{e} et 3^{e} cycles à temps plein:	3,031
2^{e} et 3^{e} cycles à temps partiel:	2,077
Professeurs à temps plein:	1,049

Historique et statuts

L'Université Laval doit sa naissance au Séminaire de Québec, fondé par Mgr de Laval en 1663. Le 8 décembre 1852, Sa Majesté la reine Victoria signait à Londres la charte royale qui octroyait au Séminaire de Québec les droits et privilèges d'université. Ce sont les dirigeants du Séminaire de Québec qui ont assumé la direction et l'administration de l'université depuis les débuts jusqu'à la fin de la Seconde Guerre mondiale. L'Université Laval

a décerné ses premiers diplômes en 1854. Le 8 décembre 1970, l'Assemblée nationale du Québec accordait une nouvelle charte à l'Université Laval, charte qui fut promulguée en même temps que les premiers statuts de la nouvelle Université Laval, le 1er septembre 1971.

Selon la nouvelle charte et les nouveaux statuts, le Conseil de l'université est l'autorité suprême de cet établissement. À ce titre, il exerce tous les droits et pouvoirs de l'université. Il est composé de 51 membres auxquels s'ajoutent neuf personnes qui ont voix consultative et qui ont le droit de faire des propositions mais non celui de voter. Le Conseil de l'université est présidé par le recteur qui est la première autorité dans l'université et qui a la responsabilité générale de la marche et du progrès de l'université.

Le Conseil exécutif exerce tous les pouvoirs de l'université, à l'exception de ceux que la charte ou les statuts attribuent exclusivement au Conseil de l'université, à un organisme ou à un administrateur de l'université et de ceux que le Conseil de l'université, par simple résolution, se réserve ou réserve à d'autres organismes ou administrateurs. Le Conseil exécutif a pour tâche principale de régler au jour le jour les problèmes que présente l'administration de l'université.

Le Conseil exécutif est formé du recteur, des vice-recteurs, du secrétaire général et de quatre membres nommés par le Conseil de l'Université.

L'Université Laval est un établissement d'enseignement mixte et non confessionnel.

Le Centre d'études nordiques de l'Université Laval

Le Centre d'études nordiques (CEN), créé en 1961, est un des plus vieux centres de recherche universitaire du Québec. Au cours de ses vingt-cinq années d'existence, il a suivi et participé aux grands changements qui ont marqué l'évolution et le développement de la recherche scientifique au Québec. Le CEN est un centre de recherche multifacultaire réunissant des chercheurs universitaires autour d'une problématique d'ensemble du domaine des sciences naturelles. Le Centre est un organisme qui structure, coordonne, réalise des recherches transdisciplinaires en Biologie, écologie et Sciences de la Terre, et analyse la nature et l'impact des processus naturels liés au froid. Il s'intéresse plus particulièrement à l'étude des écosystèmes — processus de fonctionnement et de développement (espace-temps) — en vue d'une application à plus ou moins court terme selon les besoins exprimés dans la société. Cette orientation de recherche est unique dans le réseau des centres de recherche du Québec. Il est, à l'heure actuelle, le seul organisme de recherche actif au Nord québécois.

Objectifs et infrastructure

Les objectifs du CEN sont:

1. de contribuer prioritairement à la formation d'étudiants diplômés des 2e et 3e cycles travaillant dans le cadre de la programmation scientifique du Centre,
2. de structurer, coordonner et réaliser des projets de recherche transdisciplinaires dans le domaine des sciences naturelles et
3. de maintenir et consolider une infrastructure de recherche adéquate en assurant le fonctionnement optimal des deux Laboratoires de recherche et d'un Service de logistique.

La structure administrative du CEN relève directement du vice-rectorat à l'enseignement et à la recherche qui lui alloue un budget de fonctionnement annuel selon les Statuts de l'université. Le directeur du Centre est assisté par un Bureau de direction composé de chercheurs, incluant des étudiants diplômés. Le budget annuel du CEN est d'environ 1 million $ provenant principalement (à 80–85%) de subventions externes des gouvernements fédéral (surtout CRSNG et divers ministères) et provincial (Fonds F.C.A.R. et divers ministères québécois) et de Fondations privées.

Le Centre comprend environ cinquante personnes, dont huit professeurs-chercheurs, quatre attachés de recherche (possédant un doctorat), douze étudiants Ph.D., onze étudiants M.Sc., cinq professionnels de recherche (informatique, géophysique-géomorphologie, dendrochronologie, cartographie et édition scientifique) et sept personnes attachées aux aspects administratifs, logistiques et techniques. Au cours de l'été, le Centre engage en plus une quinzaine de personnes additionnelles (surtout des étudiants de 1er cycle universitaire), afin d'assurer un meilleur encadrement technique à la recherche sur le terrain.

Au cours des dernières années, le CEN a développé considérablement son infrastructure de recherche sur le campus à Québec et sur le terrain au Nord québécois. En effet, le Centre a mis sur pied deux Laboratoires de recherche, soit le Laboratoire de dendrochronologie et le Laboratoire de radiochronologie. Le premier, le seul en son genre au Canada, assure une expertise scientifique et technique en ce qui regarde l'analyse, la datation et le traitement statistique des cernes annuels chez les arbres et les arbustes. Le Laboratoire de dendrochronologie offre ses services à l'ensemble de la communauté universitaire du Québec et des chercheurs gouvernementaux, notamment en ce qui concerne la datation précise des arbres et de pièces de bois (actuelles ou fossilisées). Le Centre collabore avec des archéologues-historiens qui désirent obtenir une date précise de certaines pièces archéologiques (ex.: bateaux basques de la côte du Labrador, pièces de bois datant du régime français, etc.). Le Laboratoire de radiochronologie complète bien le premier, en assurant la datation radiocarbone d'échantillons organiques particulièrement âgés, de l'ordre de quelques centaines à plusieurs milliers d'années.

Par ailleurs, le CEN possède deux stations de recherche dans le Nord québécois qui servent de base de recherche et de plaque-tournante pour les équipes qui travaillent dans les régions de Poste-de-la-Baleine (le long du littoral de la Baie d'Hudson) et de Kujjuaq (au sud de la Baie d'Ungava). La station la plus importante est celle de Poste-de-la-Baleine et est ouverte à l'année longue. Les deux stations sont accessibles à tous les chercheurs canadiens et d'ailleurs.

Enfin, le CEN publie la collection *Nordicana*, une série d'ouvrages scientifiques se rapportant à des questions nordiques de toutes catégories (sciences humaines et sciences naturelles). Ces publications comprennent des Actes de colloque, des monographies thématiques, des lexiques, des dictionnaires, des thèses de maîtrise et de doctorat. Tous les manuscrits sont évalués par un comité de lecture avant d'être publiés.

Programme de recherche du CEN

La programmation scientifique du Centre est définie à l'intérieur de deux programmes de recherche interdépendants, soit l'analyse spatio-temporelle des habitats froids et la dynamique des populations et des communautés. Le premier programme se réfère essentiellement à la reconstitution chronologique et géographique des principaux habitats caractérisant les biomes nordiques et leurs bordures, i.e. la grande forêt coniférienne boréale, la toundra forestière et la toundra arctique (et leurs équivalents altitudinaux au Québec méridional). Les projets de recherche découlant de ce programme abordent l'influence des climats anciens et actuels et autres événements majeurs sur le développement des habitats terrestres (forêts, toundras, etc.) et subaquatiques (tourbières). Les principaux projets ont trait à la reconstitution géomorphologique et écologique, au cours des derniers millénaires, de l'histoire du pergélisol, des forêts nordiques, des tourbières, des rebords de lacs et de rivières, des dunes et des versants. Le programme de recherche sur la dynamique des populations et des communautés prolonge le premier programme, car l'effort scientifique est porté prioritairement vers l'analyse détaillée de la structure démographique et génétique des espèces dominantes ou représentatives des habitats mentionnés précédemment. L'accent est mis sur la compréhension des mécanismes biologiques régissant leur dynamique dans un contexte climatique original et contraignant. Les principaux projets ont trait à l'influence des feux et du froid sur les forêts nordiques, sur la structure génétique des conifères, sur la structure biogéographique et écologique de la flore du Québec nordique, sur l'écologie des insectes piqueurs et sur la dendroclimatologie des régions subarctiques et subalpines du Québec. Par ailleurs, des considérations pratiques découlent de ces deux programmes de recherche, notamment ce que l'on appelle l'écologie des ruptures d'équilibre des habitats. La préoccupation du CEN ici est de mettre à profit les résultats des travaux en sciences naturelles dans la pratique en considérant, par exemple, l'étude des glissements de terrain, des crues de rivières et des feux de forêts. Le Centre envisage également la mise sur pied de projets multidisciplinaires en vue d'étudier des problèmes d'intérêt socio-économique, comme l'exploitation des forêts nordiques, la production de plants de serre et la régulation des troupeaux de caribous du Nord québécois. Ces projets seront dans la foulée d'une recherche multidisciplinaire de trois ans que le CEN vient de terminer en collaboration avec des chercheurs amérindiens et le Conseil Attikamek-Montagnais (CAM) sur la gestion des ressources fauniques par les Montagnais de la Basse-Côte Nord.

La programmation scientifique du CEN a constamment évolué au cours des vingt-cinq longues années. Elle s'est ajustée promptement à la dynamique de la recherche québécoise. Au début de son existence, le CEN touchait pratiquement tous les aspects de la vie et de la recherche nordiques, des sciences humaines aux sciences naturelles, en passant par la médecine, la philosophie et la géologie du Précambrien. Cette situation était apparemment justifiée à l'époque, car tout était à faire au Nord. Le CEN servait entre autres de structure d'accueil aux quelques chercheurs isolés désireux d'entreprendre une recherche nordique. Avec le développement accéléré et très articulé de la recherche subventionnée au Québec et au Canada ces dix dernières années, de la compétition interuniversitaire de plus en plus serrée, et du plus grand souci de planification inter-institutionnelle, les Centres de recherche dynamiques ont défini des programmes de recherche plus circonscrits. Ainsi, le CEN a développé un profil scientifique plus pointu, qui lui permet maintenant d'occuper un créneau original, essentiel et prometteur en matière de recherche et de développement nordique.

L'anthropologie des Inuit à l'Université Laval*

À l'Université Laval de Québec, les recherches anthropologiques systématiques sur les Inuit ont débuté en 1967 avec la venue d'un spécialiste reconnu, Bernard Saladin d'Anglure, comme professeur invité au département de sociologie et d'anthropologie. Lors de la création d'un département autonome d'anthropologie, en 1970, les études Inuit devaient s'y voir reconnaitre le statut de grande orientation de l'enseignement et de la recherche. Ce statut fut confirmé l'année suivante, par l'engagement de Bernard Saladin d'Anglure à titre de professeur à plein temps. En 1972, c'était au tour de Louis-Jacques Dorais et, en 1975, celui de François Trudel, autre spécialiste en la matière, d'entrer à l'emploi de l'Université Laval.

Les toutes premières années (1967-1970) virent le déroulement de grandes enquêtes thématiques dans le Québec arctique. En 1968, une recherche toponymique d'envergure permettait à Bernard Saladin d'Anglure de recueillir pour la Commission de Géographie du Québec, près de 3,000 noms de lieux inuit, accompagnées de commentaires ethnographiques. L'année suivante, ce même chercheur enquêtait sur la généalogie des principales familles inuit du Nord québécois. Parallèlement à cela, il mettait en place, entre 1967 et 1970, un réseau d'informateurs à qui il demandait de rédiger par écrit, en écriture syllabique, des textes portant sur divers aspects de la culture et de la société d'autrefois. En 1970, ce réseau comprenait 90 personnes. Leur production totale s'élève à plus de 4,000 pages manuscrites.

L'engagement permanent de Bernard Saladin d'Anglure permit de mettre en place une équipe de chercheur es professionnel les et étudiant es travaillant à temps plein sur les Inuit. Ce fut l'ère des grands programmes de recherche. Pendant dix ans, de 1970 à 1980, grâce à des subventions du Conseil des Arts du Canada (devenu depuis le Conseil de recherches en Sciences humaines), du fonds FCAC (gouvernement du Québec) et de la Fondation Killam (bourse accordée à Bernard Saladin d'Anglure), l'équipe de Laval put amasser une masse considerable de données de première main sur divers aspects de la culture, de la société et de la langue inuit du Québec arctique et de la région d'Iglulik dans l'Arctique central. Il n'y a pas lieu de détailler ici la nature de ces données. Notons simplement que les enquêtes effectuées portaient sur des sujets aussi divers que la technologie, l'économie sociale, l'ethnohistoire, l'espace social, le symbolisme, la musique et les jeux traditionnels, les arts plastiques, l'habitation et la dialectologie.

Depuis 1980, la recherche a pris une allure nouvelle. Aux grands programmes ont succédé des études plus circonscrites, combinant de courts séjours sur le terrain avec du travail en archives et des analyses en profondeur. Ces travaux, qui se poursuivent toujours à l'heure actuelle, portent sur le symbolisme dans l'Arctique central (B. Saladin d'Anglure et L.J. Dorais), l'histoire du Québec arctique (F. Trudel), le bilinguisme dans l'Arctique de l'Est (D.R. Collis, L.J. Dorais et W.F. Mackey) et l'économie sociale au Québec arctique (J.J. Simard).

Outre les départements d'anthropologie (avec B. Saladin d'Anglure, L.J. Dorais et F. Trudel) et de sociologie (où enseigne J.J. Simard), la recherche anthropologique sur les Inuit se pratique aussi au Centre d'études nordiques, au Centre international de recherche sur le bilinguisme (avec D.R. Collis et W.F. Mackey) et, surtout, l'Association Inuksiutiit Katimajiit. Cette corporation sans but lucratif, fondée en 1974 par trois chercheurs en anthropologie (B. Saladin d'Anglure, L.J. Dorais et J. Innaarulik Mark), s'est donnée pour objectifs le développement et la diffusion des connaissances sur la culture, la langue et la société inuit. La poursuite de ces objectifs prend quatre formes principales: publication de la revue *Études/Inuit/Studies*, organisation des congrès internationaux d'études inuit, animation de projets de recherche et publications diverses.

La revue *Études/Inuit/Studies* paraît depuis 1977, à raison de deux numéros par année. Bilingue (français-anglais) et unique en son genre, elle atteint un auditoire international. Ses abonnés se répartissent entre le Canada, les États-Unis, l'Europe (Danemark, France, Allemagne, Angleterre, URSS), le Groenland et le Japon.

La revue se consacre à l'étude des sociétés inuit traditionnelles et contemporaines, de la Sibérie au Groenland, dans l'optique des sciences humaines. Outre des articles de fond, elle comprend des informations scientifiques, des recensions d'ouvrages et des revues annuelles des articles et thèses de doctorat portant sur les Inuit. Elle a publié des numéros spéciaux sur les thèmes suivants: musique inuit, revendications autochtones, quart-monde nordique, Inuit du Québec-Labrador méridional, santé dans l'Arctique, Esquimaux asiatiques, communications, mythe et symbolisme, héritage de Boas. De plus, trois numéros hors-série ont respectivement porté sur les modes juridiques de solution des conflits chez les Inuit, la langue des Inuit et les populations Yuit du sud-ouest de l'Alaska.

Les congrès d'études inuit ont lieu à tous les deux ans, depuis 1978. Comme la revue, ils atteignent un auditoire international de spécialistes et de personnes concernées (Inuit ou non) venus d'Amérique du Nord, d'Europe, et même parfois d'Asie. Le dernier congrès, à l'Université Concordia (Montréal), en novembre 1984, a réuni plus de 500 personnes, dont plusieurs représentants d'organismes autochtones, du Groenland à l'Alaska. Le prochain congrès d'études inuit aura lieu lui aussi à Montréal (Université McGill) du 6 au 9 novembre 1986. On prévoit déjà des ateliers sur les droits territoriaux, les politiques arctiques, les problèmes sociaux, le chamanisme et les mouvements religieux contemporains, les communications, la santé, la langue, etc.

L'Association Inuksiutiit Katimajiit anime aussi un certain nombre de projets divers: préparation annuelle de l'annuaire téléphonique syllabique de l'Arctique oriental canadien (Bell Canada), traduction anglaise du volumineux *Dictionnaire esquimau-français* du R.P. Lucien Schneider (ministère des Affaires indiennes et du Nord), participation d'un de ses membres, le linguiste Ronald Lowe, au projet de description et d'enseignement des trois dialectes inuit de l'Arctique occidental canadien (Committee for Original Peoples Entitlement).

L'Association a enfin publié un certain nombre de monographies anthropologiques et linguistiques diverses. Sa réalisation la plus originale en ce domaine reste cependant la série *Inuksiutiit allaniagait*, recueils occasionnels de textes culturels en écriture syllabique, rédigés par les Inuit du Québec arctique. Le dernier numéro (1984) de cette série est le roman *Sanaaq*, de l'écrivaine Mitiarjuk, originaire de Kangiqsujuaq.

Pour toute information complémentaire, on peut s'adresser: Association Inuksiutiit, Département d'Anthropologie, Université Laval, Québec, G1K 7P4.

*L'Université Laval offre aussi un Certificat des Études Amérindiennes sous la direction de François Trudel du département d'anthropologie, n° de téléphone (418) 656-3039.

Les articles sur le Centre d'études Nordiques et L'Anthropologie des Inuit apparaissent dans le Bulletin de l'Association des Études canadiennes, Printemps 1986.

UNIVERSITY OF MANITOBA
WINNIPEG, MANITOBA

General information

The University of Manitoba, Winnipeg, Manitoba R3T 2N2 (204-474-9341) has 14,547 full-time Undergraduates, 6,532 part-time Undergraduates, 1,703 F/T Graduates, 1030 P/T Graduates.

Its faculties and schools include Faculty of Administrative Studies, Faculty of Agriculture, Faculty of Architecture, Faculty of Arts, Faculty of Dentistry, Faculty of Education, Faculty of Engineering, Faculty of Graduate Studies, Faculty of Human Ecology, Faculty of Law, Faculty of Medicine, Faculty of Pharmacy, Faculty of Physical Education and Recreation Studies, Faculty of Science, School of Art, School of Dental Hygiene, School of Medical Rehabilitation, School of Music, School of Nursing, School of Social Work, Continuing Education Division.

Organization of Northern Studies

Acting Chairman: Northern Studies Committee, Dr. William Koolage, University College

The Northern Studies Committee of The University of Manitoba was founded in 1962 to promote northern research and the training of students in northern research. The composition of the committee has involved northern researchers from many disciplines and members of the University administration.

The Northern Studies Committee supports pure and applied research projects relating to the theme "The Study of Man and Environment in the North." Particular emphasis is placed on field work by students.

Any University department or school may become involved in the program through submission by a faculty member of an application to the Committee Chairman. Graduate students interested in becoming involved should inquire through an appropriate department.

While there are no specialized library collections on Northern Studies at The University of Manitoba, there are a large number of resources here and in Winnipeg pertaining to the Canadian North. Notably, these are the Elizabeth Dafoe Library, the Science Library and the Medical Library at The University of Manitoba; the Hudson's Bay Archives and the Manitoba Provincial Archives. These resources, as well as more specialized collections such as the Center for Settlement Studies collection in the Anthropology Library provide extensive materials for northern research.

Selected northern courses

Faculty of Arts

Anthropology

Undergraduate Courses

76.262 New World Prehistory (3). Archaeological evidence and cultural interpretations of those New World cultures which did not develop civilizations, from the earliest inhabitants until the period of initial European contact.

76.350 Peoples of the Arctic (3). Ethnographic survey of the aboriginal peoples of the circumpolar regions of Asia, North America and Greenland. Attention will be given to the aboriginal and post-contact situations among such peoples.

76.355 Canadian Subcultures (3). An anthropological study of culture sequences and variations in Canada from the earliest evidences to the present plural society. Emphasis on ethnic interfaces and frontiers of cultural adaptations.

76.358 North American Indians: A Sociocultural Survey (3). An ethnographic survey of the traditional cultures of North American Indian peoples.

76.359 North American Indian Ethnology (3). An intensive examination of selected traditional North American Indian societies and changes after Western contact.

76.364 Manitoba Prehistory (3). Archaeological evidence and culture history of prehistoric populations which inhabited the various environmental zones of Manitoba.

76.365 Arctic Prehistory (3). A study of the archaeological evidence and prehistory of arctic and subarctic regions.

76.387 Canadian Ethnology (3). An examination of selected Canadian Indian and Inuit populations from the anthropological perspective of cultural and ecological adaptation.

Graduate Courses

76.718 Arctic Ethnology (3). An intensive study of selected problems in the ethnology of aboriginal peoples of the Arctic.

76.734 Seminar in Circumpolar and Subarctic Archaeology (3). Selected problems in interpreting the archaeological record in various regions of the circumpolar Arctic and Subarctic.

Economics

Undergraduate Courses

18.228 Social Welfare and Human Resources (6). Economic and social dimensions of poverty and inequality: income, wealth, housing, health, education, welfare. Problems and policies in Canada and abroad.

18.235 Community Economic Development (3). A study of the economic development problems of northern and native communities in Manitoba.

18.239 Introduction to Environmental Economics (3). The economics of management of water, air and land resource quality, and the economics of conservation. The economic implications of environmental standards, licencing, criteria and pollution charges will be illustrated by current issues.

18.352 Introductory Regional Economics (3). Examination of the causes and cure of regional economic disparities, with particular emphasis on Canada. Both economic theory and empirical techniques such as input-output analysis will be used.

History

Undergraduate Courses

11.369 History of Northern Canada (6). A regional history of northern Canada with particular emphasis on native people. Themes will include culture contact, economic exploitation of northern territories, and the political relationship of metropolis and hinterland in Canada.

Graduate Courses

11.760/29.7407-1 Northern Historical Studies (6). This course is based upon a number of studies of various aspects of the North. Particular emphasis is given to the North in relation to the fur trade, exploration, and Canadian development.

Geography

Undergraduate Courses

53.252 Geography of Natural Resources (3). An introduction to the basic concepts of the subject and the distribution of resources. Stress will be placed on Canadian resources and resource requirements but examples from other resource systems will also be used.

53.256 Geography of North America (6). The major regions of Canada and the U.S.A. are studied with respect to geographical patterns of their physical environment, settlement, culture, economic activity, and land use.

53.257 Geography of Canada (3). A regional study of Canada. Lectures are the same as those given during the first term of 256.

53.348 Canadian Problems (3). The geographical basis of problems pertaining to resources; rural-urban migration; competing land use; development of Arctic regions; etc.

53.352 Energy and Society (6). The course reviews in detail the role of energy in modern society. Explanation of basic energy laws and flows in the biosphere precedes discussion of energy resources, technologies, uses and impacts.

53.353 An Introduction to Land-Resource Management (6). Problems and examples drawn from Canada's north and other regions are included.

53.361 Climatic Change (6). In recent years, a major focus of this course has been on observations of climatic conditions of Hudson Bay and Hudson Strait as recorded in ships' logs of Hudson's Bay Company vessels over the past three hundred years or so.

53.369 Historical Geography of Indian Peoples in the Canadian Fur Trade (6). Emphasis is upon the changing geography of Indian peoples during the fur trade period and the cultural and ecological factors responsible for these changes.

Faculty of Dentistry

Preventive Dental Science

Undergraduate Courses

101.414 Rural and Northern Community Dentistry. Student involvement outside the school in a community clinic environment, rural or urban. Exposure to unfamiliar segments of society, motivational techniques, and delivery. 160 hours in a 4 week externship.

Faculty of Education

Curriculum: Humanities and Social Sciences or Maths and Natural Sciences

Undergraduate Courses

63.203 Introduction to Applied Linguistics (3). Examines the curricula application of modern approaches to first-and second-language instruction and their implications regarding language acquisition, linguistic change and variation, standards of usage and the teaching of phonology, grammar, and semantics in the schools.

63.214 Canadian Studies (Elementary) (3). An interdisciplinary approach to the teaching of Canadian studies. Various sources will be examined to assist teachers in the design of an integrated learning program about the homeland.

63.304 Principles of Second Language Instruction (3). This course aims to familiarize students with basic principles of second-language learning at the elementary level. Its concerns are techniques and procedures and cultural aspects. Separate sections will be offered in French, Ukrainian, German and English as a second language.

63.315 Summer Education Experience: Northern Counsellor Outdoor Education (3). Experience utilizing involvement with school children during the summer. Consists of 80 hours of training in programming, teaching and small-group communications, plus three months of experience in isolated settings.

81.209 Outdoor Education I (3). A study of the history, philosophy and scope of outdoor education. Consideration will be given to the skills, attitudes and knowledge which can most readily be taught outdoors. Field trips to observe programs will be provided.

81.315 Summer Education Experience: Northern Counsellor (3). Experience utilizing involvement with school children during the summer. Consists of 80 hours of training in programming, teaching and small-group communications, followed by three months of experience in isolated settings.

Graduate Courses

63.729 Field Studies in Curriculum: Humanities and Social Sciences I (3). A critical investigation of selected curricular problems related to individual learners and school organization. Project work will include visits and field investigations.

81.533 Instructional Television & Radio (6). Uses of radio, television and video tapes in education. Includes writing and production of scripts, techniques of classroom use, selection and operation of equipment and review of research literature.

Educational Administration and Foundations

Undergraduate Courses

116.201 Comparative Studies in Education (3). An examination of aspects of the educational process in various societies with relation to themes of sociocultural change.

116.203 History of Canadian Education (3). A survey of the historic development of educational theory and practice in Canada.

116.303 Cross-Cultural Education (3). An examination of teacher attitudes, teaching techniques and curricular modifications which will facilitate learning in cross-cultural situations. Studies will focus on accommodation among cultural groups in rural and urban centres.

Graduate Courses

116.502 Principles of Curriculum Development (3). An examination of approaches to curriculum design, influences on the design process and aspects of implementation. Emphasis is given to teacher participation in creating curriculum.

116.531 Problems in Cross-Cultural Education (3). A study of selected problems encountered by cultural minorities in various educational settings.

116.718 Seminar in Cross-Cultural Education

Various departments offer independent research courses which the student designs in co-operation with an instructor and may provide opportunity for individually designed northern focus in that particular field.

Faculty of Graduate Studies

Freshwater Institute of the Fisheries Research Board

A major national laboratory of the Fisheries Research Board is located on campus. Co-operative graduate programs are supervised under the University's Aquatic Biology Research Unit.

Natural Resources Institute
Director: Dr. W.R. Henson

The Natural Resources Institute was established in 1968 with a three-fold purpose: (a) to teach management skills leading to a graduate degree of Master of Natural Resources Management (M.N.R.M.); (b) to conduct applied research on resource problems; and (c) to provide a forum for examining problems in resource use.

The teaching of the Institute is centered on a two-year program leading to the degree of M.N.R.M. Coursework consists of a core of courses within the Institute and additional work in related departments of the University. A total of 60 hours including the preparation of a practicum is required.

The teaching, research and analytical work of the Institute are closely co-ordinated and designed to provide the students with preparation for immediate engagement in management problems at a high level. There is an active publication program involving the results of student and faculty research. Members of the university outside the Institute as well as colleagues from all levels of government, industry and non-governmental organizations are active in the work of the Institute.

Canada Biting Fly Centre
Director: Dr. Mary M. Galloway

Mosquitoes and black flies have always been identified as major pests of humans and other animals. The Canada Biting Fly Centre, established in 1979, facilitates and encourages increased effort and co-ordination needed by specialists to solve problems posed by these and other biting flies. Its staff is concerned with entomological problems of national and regional significance confronting human health, livestock production, national defence, northern development, environmental quality, industry and wildlife.

The centre maintains an ongoing assessment of expertise and techniques in biting fly research, abatement and surveillance activities in Canada, including the testing of products such as pesticides. It provides continuity and guidance for current and future endeavours directed against biting flies. It also provides a mechanism for serving the needs of industry confronting problems caused by biting flies. Finally, it helps in the training of personnel in biting fly control by offering workshops and recommending curricula for training programs.

Teaching in the North

Continuing Education Division

Inter-Universities North Program
In co-operation with Brandon University and the University of Winnipeg, courses in Arts, Science and Education are offered in communities north of the 53rd parallel (see Distance Education section of this volume).

School of Social Work

School of Social Work at Thompson
The School of Social Work at Thompson is a four and one-half year university degree program located in Thompson, Manitoba, and delivered by The University of Manitoba in Winnipeg. The program is sponsored by the Province of Manitoba: Department of Education — Adult Continuing Education Branch and by the Government of Canada: Department of Regional Industrial Expansion — Canada Manitoba Northern Development Agreement. The School of Social Work at Thompson is designed to provide admission into the University of Manitoba, for northern students who have not had the opportunity to do so for the following reasons: lack of formal education, social, economic, or cultural factors and/or residence in the north or isolated areas. Applicants must be twenty-one years of age or older at the time of applying or when classes begin, and priority is given to those residents of the north who have the greatest need from the standpoint of lack of financial resources, lack of educational preparedness and remote location. Other residents of less remote locations will also be considered if they meet the above criteria. As the Program develops, there will be some allowances for part-time and/or occasional students for those who do not meet all of the above-mentioned criteria.

Application forms for the School of Social Work at Thompson will be accepted until October 15 of each year. Students are selected in November to begin classes the first week of January. Application forms are available at the following address:

School of Social Work at Thompson
3 Station Road
Thompson, Manitoba
R8N 0N3
Attention: Shelly Van Buskirk
Phone: (204) 778-7385

Distance Education

Continuing Education Division

Off-Campus Courses

Credit courses are offered by a number of faculties in many communities outside Winnipeg. These courses are open to regular and mature students as well as to those who have a general interest in the course. New centres for off-campus courses are established where justified by the level of interest and demand.

For further information, please contact:
Professor George Smith
Teleconference/Off-Campus Co-ordinator
Telephone: (204) 474-9921 or 261-5760
Manitoba Toll Free: 1-800-432-1960 Ext. 9921

Correspondence Courses

63.214 Canadian Studies (Elementary) (3). An interdisciplinary approach to the teaching of Canadian studies. Various sources will be examined to assist teachers in the design of an integrated learning program about the homeland.

116.201 Comparative Studies in Education (3). An examination of aspects of the educational process in various societies with relation to themes of sociocultural change.

116.203 History of Canadian Education (3). A survey of the historic development of educational theory and practice in Canada.

116.303 Cross-Cultural Education (3). An examination of teacher attitudes, teaching techniques and curricular modifications which will facilitate learning in cross-cultural situations. Studies will focus on accommodation among cultural groups in rural and urban centres.

116.531 Problems in Cross-Cultural Education (3). A study of selected problems encountered by cultural minorities in various educational settings.

43.509 Theories and Issues in School Counselling (3). A study of the philosophy and theories of counselling; issues in school guidance and counselling.

43.511 Secondary-School Counselling (3). A study of counselling as related to secondary-school practice. Emphasis on the secondary-school counsellor's role and functions. Examination of the various counsellor services: educational, orientation, staff, etc.

Correspondence courses are available in Arts, Education and Science during the regular session. All correspondence courses have the same content and starting time as the identical course numbers offered on campus during the regular session. Students enrolled in correspondence courses are required to meet the same standards as students in attendance on campus. Each year more than 700 adults enroll in correspondence courses with The University of Manitoba. The students are from all walks of life. They are homemakers, teachers, farmers, senior citizens, factory and office workers, members of the Canadian Armed Forces and many more. For each correspondence course in which a student registers, The University of Manitoba Correspondence Program sends an outline containing study notes, reading material and assignment questions. Some courses also include audio tapes and other learning aids. Each course has been specially designed so that students may study at home. Students may purchase their textbooks by mail or in person from the University Book Store. The Faculty of Education, through the University mainframe and shared message pools, is able to communicate easily with students in the North. The Library electronic data bases similarly have much potential for students. Eric and Dobis systems are becoming better known and the search results can be transmitted from the Education office if the student does not have direct access.

For further information, please contact:
Correspondence Co-ordinator
541 University Centre
The University of Manitoba
Winnipeg, Manitoba R3T 2N2
Phone: (204) 474-9921 or 261-5760
Manitoba toll free: 1-800-432-1960 Ext. 9921

Information concerning program offerings or degree requirements for a specific faculty:

Faculty of Arts General Office	474-9302
Faculty of Education	
Records Supervisor	474-9091
Graduate Advisor	474-9011
Faculty of Science General Office	474-8256

Teleconference Courses

Teleconferencing is a method of taking courses by using the telephone lines. It is similar to a party-line telephone connecting small groups of students in several communities with the instructor in Winnipeg. The Teleconference class operates like a phone-in radio program where all groups phone in at the same time. Students and instructors are able to talk to each other using a microphone and to hear each other through a loudspeaker during the entire class. A Local Community Co-ordinator provides on-site assistance and is the link with the University. Teleconference courses are now offered in a number of locations in rural Manitoba. Each location where courses are offered is linked to the other centres and the instructor by means of a telephone network. For further information, please contact:

Professor George Smith
Teleconference/Off-Campus Co-ordinator
The University of Manitoba
Winnipeg, Manitoba R3T 2N2
Phone: (204) 474-9921 or 261-5760
Manitoba Toll Free: 1-800-432-1960 Ext. 9921

Local Community Program Co-ordinators:
Flin Flon:
Mrs. Marion Terry
308 Prince Charles Place
Flin Flon, Manitoba
R8A 1M7
Telephone: (204) 687-5893 (H)
(204) 687-5361 (O)

Powerview/Pine Falls:
Ms. Eunice Cyr
Box 23
Powerview, Manitoba
R0E 1P0
Telephone: (204) 367-8724 (H)
(204) 367-2296 (O)

Portage la Prairie:
Gerri Pankhurst
920 Crescent Road West
Portage la Prairie, Manitoba
R1N 0Z2

The Pas:
Mrs. Peg McCracken
Box 1083
The Pas, Manitoba
Telephone: (204) 623-5035 (H)

Thompson:
Ms. Shirley Phillips
C/O Inter-Universities North
Box 23, 59 Elizabeth Road
Thompson, Manitoba
R8N 1X4
Telephone: (204) 778-4411 (O)

Information on Degree Regulations, Course Prerequisites, Program Approval is available from the following:

Faculty of Arts:	
General Office	474-9302
Student Advisors	474-9695
	474-9352
	474-9055
	474-9113
Faculty of Education:	
Undergraduate Advisor	474-9003
Graduate Studies	474-9011
Faculty of Science:	
General Office	474-8256
Student Advisor	474-9714
Admissions Office:	474-8527
	474-8528
Student Records Office:	474-9423
Fee Assessment (Student Records Office):	474-9420
Fee Payment (Comptrollers Office):	474-9433
Bursaries, Student Loans (Awards Office):	474-9531

Inter-Universities North Program

Inter-Universities North is a co-operative program of the three Manitoba universities, Brandon University, The University of Manitoba and the University of Winnipeg and is funded by the Province of Manitoba through the Universities Grants Commission. The mandate of the program is to provide credit courses to residents living north of the 53rd parallel. Academic matters and program development are the responsibility of the I.U.N. Program Executive Committee, representing all three universities. The administrative functions of Comptrolling and Library services are primarily the responsibility of The University of Manitoba and Brandon University, respectively. Other administrative matters and the day-to-day operation of the program are handled from the I.U.N. Office, Provincial Building, 59 Elizabeth Road, Thompson, Manitoba.

For further information please contact:
Dr. Gordon Thompson
Continuing Education Division
The University of Manitoba
Winnipeg, Manitoba
R3T 2N2
Telephone: (204) 474-9921
Manitoba Toll Free: 1-800-432-1960 Ext. 9921

Management Studies Section

- Certificate Program for Manitoba Municipal Administrators. This program has been offered by correspondence, supplemented by regional seminars, since 1965.
- Certificate in the Management of Community, Economic and Organization Development. This certificate program is co-sponsored by the Keewatin Tribal Council, Southeast Resource Development Council and West Region Tribal Council and regularly offers management training courses at Northern locations.
- Certificate Program in Quality Assurance Management by Correspondence. This is a certificate which is offered to individuals who have completed Grade XII and are currently working in management, quality control or a related field.
- The National Correspondence Courses in Real Estate Appraisal.

For further information, please contact:
Prof. Don Castleden
Continuing Education Division
The University of Manitoba
Winnipeg, Manitoba
R3T 2N2
Telephone: (204) 474-9921

Co-op programs and special credit arrangements

Continuing Education Division

University of Manitoba Access Program

Director: Dr. D. Poonwassie, Telephone (204) 474-9921

In co-operation with the Province of Manitoba and the Government of Canada (DREE) The University of Manitoba Access Program (U.M.A.P.) facilitates university studies at the degree level for persons who traditionally have not had the opportunity for such experience because of social, economic and cultural reasons, lack of formal education or residence in remote areas. Applicants must be from within the Northlands Agreement boundary. Students in this program are provided with academic, financial and personal supports.

Special Pre-Medical Studies Program

Director: Dr. D. Poonwassie, Telephone (204) 474-9921

This program is designed to prepare Manitobans of Native Indian ancestry for entry to the health-related professions such as Medicine, Dentistry, Pharmacy, etc.

Through the co-operation of the Province of Manitoba, the Government of Canada and The University of Manitoba, students in this program are provided with academic, financial and personal supports.

Canadian Forces Program
Program Co-ordinator: M.J. Piercy, Telephone (204) 474-8005

The University of Manitoba Canadian Forces Program is designed to assist Regular Force personnel and their dependents in the pursuit of a university education. The program attempts to alleviate the problems associated with completing a degree as a part-time student.

The extensive mobility of Canadian Forces personnel, which often interrupts studies and increases the difficulty of satisfying the residence requirement for graduation, is taken into account by this program. Counselling services are provided by a Program Co-ordinator.

Department of Transport Program
Program Co-ordinator: A. Laliberte, Telephone (204) 474-9921

The University and the Federal Department of Transport have undertaken an innovative program to provide training and education for department employees and their dependents. The program is designed primarily to facilitate the completion of degrees through on-site instruction, correspondence and transfer of credit from other recognized institutions.

Faculty of Engineering

Engineering Access Program
Director: Professor John Glanville, Telephone (204) 474-9872

The Engineering Access Program (ENGAP) is a program that provides access to an engineering education for persons of Native ancestry who, for financial, social or cultural reasons, have not had the opportunity.

ENGAP has been established in a joint agreement between the Province of Manitoba and The University of Manitoba. Manitoba Education, through its Adult and Continuing Education Branch, provides the funding and reserves the right to rule on the eligibility of students; the University, through the Faculty of Engineering, administers and operates the program and reserves the right to rule on admissibility of students, and on all academic matters.

To be eligible for the program, students have to be Status or Non-Status Indian, or Metis, who are residents of the Province. To be admissible, students are either Mature Students or satisfy the normal admission requirements of the University. Those who do not meet the more stringent academic requirements of the Faculty of Engineering can be admitted on the recommendation of the Dean.

Students are selected for the program by a committee drawn from the University, Manitoba Education, various Native organizations and other similar programs. Selection decisions are based on a combination of student need and chance of success in an engineering education.

The academic support provided by ENGAP includes pre-engineering instruction and tutoring in regular First Year Engineering subjects. The academic program has been designed so that pre-engineering and regular First Year Engineering will be completed in two years. About one-quarter to one-third of First Year courses (individual student programs may be different, depending on academic background) are taken, along with pre-engineering instruction, in the first year of the Program, the remainder being taken in the second year. Students in the Program will attend regular First Year Engineering classes with other engineering students, and will, consequently, be subject to the same standard of academic assessment. Subsequent progress through the Faculty will be in common with the rest of the student body.

Transfer of Credit

Students Transferring From One Faculty/School Within The University of Manitoba to Another Faculty/School of the University: All University of Manitoba courses (including the credit hour values and grades) taken prior to the transfer, must be transferred to the receiving Faculty/School into which the student is transferring. Courses transferred in this manner will bear a course classification of TR (Transfer) or T (if mid-session transfer) and will enter into the grade point average calculations of the receiving Faculty/School.

Students Transferring Courses Earned Elsewhere: All courses acceptable to the Faculty/School of the University of Manitoba must be transferred to that Faculty/School and will bear the course classification of TR (transfer). Credit for any transferred course will be given only in terms of hours earned. The average that must be obtained in a particular Faculty/School will be determined solely on work completed at The University of Manitoba. This regulation may vary dependent upon the Faculty/School and students are urged to consult the regulations on file at the Office of the Dean/Director of their Faculty/School.

Letter of Permission for Transfer of Credit

Students in degree programs at this University may take courses at other recognized colleges or universities for transfer of credit provided such courses are approved in advance by the faculty or school in which they are currently registered. The approval is subject to individual Faculty/School regulations and is granted in the form of a Letter of Permission. To obtain a Letter of Permission, application must be made to the Student Records Office as early as possible and at least one month prior to when required at the other institution. The application for a Letter of Permission is available at the Student Records Office. Each application must be accompanied by the appropriate fee. The fees are for each application and a separate application is required for each session and institution regardless of the number of courses being considered. Students planning to seek permission to take courses elsewhere for transfer of credit to The University of Manitoba are cautioned to check the current Calendar for the residence and degree requirements of the degree programs in which they are enrolled. Credit for any transferred course will be given only in terms of hours earned. Each student should note that the average that must be obtained in a particular faculty or school will be determined solely on work completed at The University of Manitoba.

Northern research

The University of Manitoba, while supporting a broad spectrum of research in the physical and social sciences, applied and theoretical, has been especially strong in the areas of Northern biology, health and cross-cultural education. Many of these projects have involved Northerners, especially Inuit and Indians as researchers, research assistants and fieldworkers.

Approximately ten to twelve student trainees are supported under Northern Scientific Training Program grants which are initially vetted by the Northern Studies Committee.

Churchill Northern Studies Centre

The Churchill Northern Studies Centre was incorporated in September, 1976 under the Laws of Manitoba as a non-profit body "to promote northern studies through the creation, maintenance and operation of a northern research station." The Letters Patent permit wide authority to carry out research and other studies relating to natural resources, in connection with industrial development, transportation, construction and much else; to make studies concerned with the ecological balance in northern Canada, preservation of wildlife, and the economic viability of northern communities, etc.

The Northern Studies Centre is unusual, at least in North America, in being neither a government undertaking nor an offshoot of a university. It was founded by local citizens to provide facilities for the use of scientists and local participation in its activities is assured.

Accommodation for the Centre has been provided in buildings formerly utilized by the Government of the North-West Territories; there are basic laboratory facilities, residential accommodation and lecture room facilities.

The Centre is the only station north of the treeline to offer university credit field courses to students from across Canada and abroad. The site of the Centre was chosen because of its easy accessibility from the south, its historical importance as a fur-trading and research base, its present importance as a seaport and its obvious significance to biologists and geographers.

Taiga Biological Station

The University Field Station is situated east of Lake Winnipeg and provides facilities for graduate students interested in boreal ecology, mammalogy and wildlife biology. The field station is supported by the Taiga Biological Research Trust and various research agencies. Contacts should be through Dr. W.O. Pruitt, Department of Zoology.

Manitoba Government Department of Natural Resources.

The Department of Natural Resources maintains camps throughout Manitoba. Various field work is undertaken at these centres. Use of these facilities is by arrangement with the Regional Manager of the Department, through the Head of the Department of Zoology.

Northern specialists

Brust, R.A., Entomology, Arctic and Subarctic
Catchpole, A., Geography, Subarctic and Arctic
Dean, J., Economics, Northwest Territories
dePena, J., Anthropology, Arctic
Deprez, P., Economics, Northern Canada
Friesen, J., History, Northern Canada
Garro, L., Social and Preventive Medicine, Health, Subarctic
Gibson, R.D., Law, Constitutional and Human Rights Law
Gray, J., Economics, Northwest Territories
Harvey, C., Law, Administration of Resources
Kaufert, J.M., Social and Preventive Medicine, Health, Arctic
Koolage, W., Anthropology, Northern Canada
Loxley, J., Economics, Economic Development, Northern Canada
Matthiasson, J., Anthropology, Arctic
McDonald, N., Education, Subarctic and Arctic
Moffatt, M., Northern Medical Unit, Health, Arctic
Moodie, D.W., Geography, Subarctic and Arctic
Murdoch, J., Education, Native Languages
Nepon, B.P., Law, Native Peoples and the Law
Phillips, A., Law, Transportation Law
O'Neil, J., Social and Preventive Medicine, Health, Arctic
Postl, B., Northern Medical Unit, Health, Arctic
Pruitt, W., Zoology, Arctic and Subarctic
Riewe, R., Zoology, Arctic and Subarctic
Riffel, J.A., Educational Administration, Northern Manitoba
Robinson, A.G., Entomology, Arctic and Subarctic
Sealey, D.B., Cross-Cultural Education, Subarctic and Arctic
Schwartz, B.P., Law, Native Land Claims
Shay, C.T., Anthropology, Subarctic
Shay, J., Botany, Subarctic
Stene, L., Geography, Geomorphology, Yukon
Townsend, J., Anthropology, Alaska, Subarctic
Wolfart, H.C., Linguistics, Algonquian, Subarctic
Young, T.K., Social and Preventive Medicine, Health, Subarctic

Native Studies

The Department of Native Studies was founded by The University of Manitoba in 1975 at the urging of and in consultation with Native students and organizations. The Department is in the Faculty of Arts and teaches a wide variety of courses in Native Canadian societies and cultures as well as Cree and Ojibway languages. There are currently six full- and part-time staff and approximately 350 students enrolled in the courses offered in 1985-86. (Not all the courses listed below are taught in any given year.)

32.120 The Native Peoples of Canada (6). A Survey of the political, social and economic situations of the contemporary Indian, Metis and Inuit peoples of Canada.

32.202 The Metis of Canada (3). A history of the Metis of Canada from 1860 to the present.

32.203 Coastal Indians of Canada (3). A history of Coastal Indians of Canada to the present.

32.204 The Native Peoples of the Northern Plains (3). A study of the history of Native peoples of the Northern Plains with emphasis on Canadian Plains Indians.

32.220 Native Societies and the Political Process (6). An analysis of contemporary Canadian (and U.S.) political and administrative processes as these affect Native peoples, and a survey of the objectives of Native political groups.

32.240 American Native Literature (3). A study and analysis of selected Native literature of the United States. A variety of literature such as poetry and novels will be studied to give an appreciation of Native philosophies, traditions and cultures.

32.241 Canadian Native Literature (3). A study of literature written by Canadian Native peoples during the nineteenth and twentieth centuries. A variety of literature such as poetry and novels will be studied to give an appreciation of Native philosophies, traditions and cultures.

32.320 Native Organizations (6). A study of local, regional and national Native organizations in contemporary North America and their interaction with government and private agencies.

32.321 The Native Identity (6). A study of Indian, Metis and Inuit values and cultures, with emphasis on art forms, religious traditions and literature.

32.323 Native Peoples and the Law II (3). A study of Native peoples' relationships to civil and criminal law in modern Canadian society.

32.324 Native Medicine and Health (3). The health, disease and medical practices of North American Native peoples. A survey of the health and health care of North American Native people from pre-contact to modern times. Special attention will be paid to traditional concepts of health and healing practices.

32.325 Native Peoples and the Law I (6). A survey of laws relating to Native Peoples, principally in Canada. Topics will include legal aspects of aboriginal title, Indian treaties, Indian and Metis land claims, the Indian Act, hunting and fishing rights, self-government and constitutional issues.

32.329 Independent Research (3). Supervised research or field work; findings will be presented in a major paper. This course is available only to third-year students majoring in Native Studies.

32.373 Art of the North American Native Peoples (3). A survey of artwork of Native peoples in North America. A special emphasis on the interpretation and appreciation of Native art by Native artists.

Native Languages

32.090 Introductory Cree (6). A practical course intended for students who are not fluent in Cree. Emphasis will be on oral work for the purpose of learning basic sound and grammatical patterns. Some reference will be made to structural differences between Cree and English.

32.091 Introductory Ojibway (6). Practical course intended for students who are not fluent in the Ojibway language. Emphasis will be on oral work for the purpose of learning basic sounds and grammatical patterns. Some attention will be given to the structural differences between Ojibway and English.

32.121 Intermediate Ojibway (6). Continued development of conversational fluency.Ojibway orthography, composition and translation. Introduction to linguistic structure of Ojibway.

32.130 Intermediate Cree (6). Continued development of conversational fluency. Cree orthography, composition and translation. Introduction to linguistic structure of Cree.

32.201 Northern Algonkian Languages (3). A survey of the structure of Swampy Cree, Moose Cree, Plains Cree (Alberta), Woodland Cree, Montagnais, Neskapie and Ojibway with particular attention to a shift from oral tradition to printed communication.

32.230 Cree Literature (3). A survey of Cree literature based on the extensive study of particular texts in cultural, historical and spiritual contexts.

32.231 Ojibway Literature (3). A survey of Ojibway (Eastern, Western, Chippewa, Saulteaux, Odawa, others) literature based on the extensive study of particular texts in cultural, historical and spiritual contexts.

32.232 Structure of the Cree Language (3). A detailed structural analysis of Cree with special attention to the problem of dialect variation and to the contrastive analysis of Cree and English.

32.233 Structure of the Ojibway Language (3). A detailed structural analysis of Ojibway with special attention to the problem of dialect variation and to the contrastive analysis of Ojibway and English.

Native Students Office. Telephone (204) 269-1156

The Native Students Adviser provides individual and group support for students, mainly those of Native origin to aid them in deriving maximum benefit from their university experience. Academic, personal, financial and career advice and counselling is offered. The adviser initiates and develops orientation programs for new and prospective students and supports the activities of the Indian, Metis and Inuit Student Association. The Office/Lounge serves as a resource centre regarding Native issues and as a social centre for students to meet and discuss common experiences.

McGILL UNIVERSITY
MONTREAL, QUEBEC

General information

McGill University, 845 Sherbrooke Street West, Montreal, Quebec, H3A 2T5 General telephone: 514-392-4311 Telex: 05-268510

McGill is one of Canada's major universities. It has approximately 22,000 undergraduate and graduate students.

Major faculties and schools

School of Architecture; Faculty of Arts and Sciences; School of Computer Science; Centre for Continuing Education; Faculty of Dentistry; Centre for Developing Area Studies; Centre for East-Asian Studies; Faculty of Education; Faculty of Engineering; Faculty of Graduate Studies and Research; Centre for Human Genetics; Instructional Communication Centre; Institute of Islamic Studies; Faculty of Law; Graduate School of Library Studies; Faculty of Management; Faculty of Medicine; Faculty of Music; School of Nursing; Nutrition and Food Science Centre; Centre for Northern Studies and Research; School of Occupational Health; Institute of Oceanography; Centre for Plant Molecular Biology; Centre for the Study of Regulated Industries; Faculty of Science; School of Social Work; Centre for University Teaching and Learning; School of Urban Planning.

Organization of Northern Studies

The first formal description of the Centre for Northern Studies and Research appears in the notes of a meeting of the Executive Committee of December 20, 1973:

> "The Centre encourages, promotes, undertakes and coordinates within the University research and teaching related to the North."

The founding of the Centre was the continuation of a tradition of northern studies and research dating back some fifty years.

In October 1985, the Centre moved to new and larger quarters. These premises afford us very adequate and pleasant space for our activities. In addition to these facilities the Centre also comprises the McGill Subarctic Research Station in Schefferville, the Axel Heiberg Field Station, and the Northern Studies Library Collection.

Dr. Marianne Stenbaek, Co-Director,	392-8202
Dr. T.R. Moore, Co-Director,	392-8245
Doug Barr, Station Manager, Schefferville,	392-8209

A more detailed description of the Centre and its work follows:

The Centre for Northern Studies and Research is engaged in education and research on all aspects of the Circumpolar North. The Centre promotes research both in the physical and social sciences, as well as in the humanities. The Centre's main orientation is Arctic Policy. It is also very active in research and training programs related to the natives of northern Quebec, the Eastern Arctic, as well as Greenland. An Inuit teacher training program and an Inuit social workers training program are carried out at McGill. A number of field fellowships are awarded annually to undergraduate and graduate students pursuing studies in the North.

It is the objective of the Centre to become a major player in the development of the Circumpolar North and to promote the education of students to actively take part in policy-making and research in the area; to co-ordinate and implement research involving industry, government and Inuit groups. The Centre is actively pursuing a strategy of co-operative research between the university and constituencies it serves. It is therefore particularly interested in co-operative research with Inuit organizations.

The Circumpolar North is emerging as a new force in world politics, military strategy and resource development. In contemporary politics new international but regional spheres, such as the Middle East or South East Asia, are emerging. Areas that are diverse but which have very strong cultural bonds and, more importantly, common development problems as to their military, environmental and industrial strategies. Such a transnational/international/regional area is now rapidly developing in the Arctic. The Centre plays a major role in the development by its orientation towards Arctic Policy.

The Centre moreover operates two field stations in the North which provide facilities for field training and research: the Schefferville Station in Quebec and the Axel Heiberg Research Station in the High Arctic.

The McGill Station on Axel Heiberg Island is a remote High Arctic field station which was established in 1960. It is located close to Colour Lake near the head of Expedition Fiord, on the west coast of Axel Heiberg Island. Access to the station is by air through Resolute or Eureka. The edges of the White and Crusoe Glaciers are at present approximately 3 km from the station. The actual site is the side of a gypsum dome (Gypsum Hill) on the north side of Expedition River.

The Schefferville Research Station was founded in 1954. The objective of the station is to provide a base and laboratory facilities for studies of the eastern Canadian subarctic. Over the past 30 years a wide range of topics have been examined, but most current attention focuses on process-oriented studies and emphasizes climatology, hydrology, permafrost, ecology, limnology and snow and ice. The station is open year-round and is occupied by a station manager and a technician. It consists of residential facilities for up to 30 researchers, has laboratories, a microcomputer, workshop, darkroom and library.

One of the Centre's main activities is to hold international conferences on issues of concern and research in the Inuit North. Last year it hosted the Arctic Policy Conference. This year it will host the Fifth Inuit Studies Conference. It furthermore organizes public seminars on specialized northern-related subjects each year.

The Centre publishes the McGill Subarctic Research Papers. 40 volumes have been published to-date. It has also published two volumes on Arctic Policy and will continue to publish on this subject. A newsletter will be published 3-times a year, starting October 1986.

The Centre is also presently exploring the possibility of creating a Scandinavian Studies program and will host a series of lectures and film showings related to Sweden and Denmark.

A Northern Studies Collection is maintained in the Physical Sciences and Engineering Library of McGill in conjunction with the Centre.

In 1982, the North Slope Borough in Alaska founded the Eben Hopson Chair of Arctic Policy in memory of Eben Hopson, the founder of the Inuit Circumpolar Conference. This Chair is in the Faculty of Arts but has close connections to the Centre for Northern Studies and Research.

Northern courses

At the moment discussions are underway to set up a Minor in Northern Studies. However, a great number of undergraduate and graduate studies have a northern component.

Teaching in the North

McGill's program of Native and Northern Teacher Education operates in Northern Quebec and the eastern N.W.T. (see elsewhere in this volume).

Cooperative education

We do not have, at the moment, any coop programs. However, it is possible to arrange transfer of credits from a variety of colleges to the university.

Northern research

We are in the process of publishing a new Inventory of Northern Researchers at McGill and the kind of research they are involved in. The research at the Centre focuses very much on Arctic Policy. The research at McGill in general ranges from medicine to education, to engineering, to anthropology. It is a very wide scope.

Native Studies

At the moment we have no Native Studies at McGill.

McMASTER UNIVERSITY
HAMILTON, ONTARIO

General information

McMaster University, 1280 Main Street, West, Hamilton, Ontario L8S 4K8, (416-525-9140) has 10,071 full-time undergraduates and 3,068 part-time undergraduates. There are 1,205 full-time and 896 part-time graduate students. Undergraduate Summer School (1984) 2,650. The major faculties are: Business, Engineering, Health Sciences (including Schools of Medicine and Nursing), Humanities, Science, Social Sciences (including Schools of Physical Education and Social Work), School of Graduate Studies, McMaster Divinity College.

Organization of Northern Studies

Northern studies are loosely organized under the Presidential Committee on Northern Studies (P.C.O.N.S.) which was established in 1973 and charged to encourage and facilitate northern studies within McMaster and to provide a formal means of communication between persons with interest in this area.

P.C.O.N.S. Chairman — Wayne Rouse (416) 525-9140 ext. 4538.

A special feature at McMaster is the Berry collection of Inuit sculpture.

Select northern courses

Anthropology

2B3	Native people of North America
2O3	New World prehistory
	Ethnology
3A3	The Canadian north
3F3	Contemporary northern people
	Canadian Studies
2A3	Canadian regional studies
2B3	Canadian social and cultural studies

Geography

2E3	Canada
2M3	Physical landscapes of Canada
3D3	Historical geography of Canada
3W3	Hydrology in Canada
4Q3	Climate in high latitudes
4Z3	Advanced cultural geography

Religious Studies & Sociology

3B3	Native and ethnic religions in Canada
4O3	Regionalism and regional development in Canada

Teaching in the North

Field courses in plant ecology and climatology are periodically offered at Churchill through the Churchill Northern Studies Centre.

Distance Education

The Centre for Continuing Education offers a correspondence programme in Human Services.

Northern research

The Program for Technology Assessment in Subarctic Ontario (TASO) is an interdisciplinary research program established at McMaster University to undertake long-term research in anticipation of resource development in Northern Ontario over the next ten to twenty years. The project is initially focussed on the economic, social and environmental impacts of potential hydroelectric energy projects for the major river systems draining into James and Hudson Bays. The TASO research report series provides a vehicle for distributing the results of studies undertaken by TASO associates, and includes papers of a technical nature, as well as papers prepared for presentation to non-specialist groups. Further information on TASO can be obtained from Dr. Wayne Rouse, Acting Director, Research Program for Technology Assessment in Subarctic Ontario, Geography Department, McMaster University, Hamilton, Ontario, L8S 4K1.

Other ongoing research programs in the north can be listed as follows. Archeological, coastal geomorphological and hydrologic studies in the high arctic. Climatic, hydrologic, plant ecological and anthropologic studies in the low arctic and in the subarctic with particular emphasis in the Hudson Bay lowlands.

The research projects are supported primarily through grants from N.S.E.R.C., S.S.H.R.C. and the Donner Canadian Foundation. Student grants in the form of Northern Scientific Training Grants have been an important source of support.

Northern specialists

Bunting, Brian	— Geography, Arctic Soils, N.W.T.
Damas, David	— Anthropology, Hudson Bay
Feit, Harvey	— Anthropology
Finsten, Laura	— Anthropology, Arctic Is.
George, Peter	— Economics, TASO, Environmental Impact Assessment, Hudson & James Bays
Drake, John	— Geography, Modelling ground water movement, N.W.T.
Ford, Derek	— Geography, Limestone solution, Nahanni
MacDonald, Glen	— Geography, Biogeographical Studies, N.W.T.
McCann, S. Brian	— Geography, Beach processes, Arctic Is.
Preston, Richard	— Anthropology, Arctic Is.
Rouse, Wayne	— Geography, TASO, Climatology Hudson & James Bays, N.W.T.
Kershaw, K.A.	— Biology, TASO, Plant Ecology, N.W.T. & Hudson & James Bays
Noble, Wm.	— Anthropology, Hudson Bay lowlands
Ramsden, P.	— Anthropology
Risk, M.J.	— Marine Geology and Ecology, Arctic coastal zone
Woo, Ming-ko	— Geography, TASO, Hydrology, N.W.T., Hudson & James Bays

Sample northern publications

TASO Reports

1. Evaluating the Environmental Impact of Hydroelectric Development in Northern Ontario: a Preliminary Report. By R.A. Muller and P.J. George. September 1982, pp. 50.
4. Algonquian People and Energy Development in the Subarctic. By Richard J. Preston. June 1983, pp. 25.
5. The Royal Commission on the Northern Environment: Preliminary Hearings, Submissions, and the Interim Report, 1977-78. By Jennifer M. Blythe. August 1983, pp. 48.
6. Optimal Expansion of Hydroelectric Capacity in Northern Ontario. By R.A. Muller and P.J. George. August 1983, pp. 37.
11. A Survey of Social Impact Assessment: Theory and Practice. Volume V: Bibliography. By Peggy Martin Brizinski. September 1983, pp. 22.
12. Moose River, an Unorganized Community in Northeastern Ontario: a Preliminary Report. By Jennifer M. Blythe. November 1983, pp. 27.
13. Northern Hydroelectric Development in an Optimal Expansion Program for Ontario Hydro. By R.A. Muller and P.J. George. April 1984, pp. 33.
14. Modification of Streamflow Regime by Regulation in Northern Ontario Basins. By P. Waylen, M.K. Woo and A. Paterson. August 1984, pp. 41.
15. The Royal Commission on the Northern Environment: Main Hearings. By Jennifer M. Blythe. November 1984, pp. 57.
16. Large Scale Indicators of the Impact of Hudson and James Bays on Climate in the Hudson Bay Lowlands. By Richard L. Bello and Wayne R. Rouse. April 1985, pp. 24.
17. The Potential for Climatic Modification in the Hudson Bay Lowlands through the Influence of the Ocean on the Energy Balance. By Wayne R. Rouse and Richard L. Bello. May 1985, pp. 27.
18. Vegetational Analysis of Southern James Bay. By Kern Ewing and Kenneth A. Kershaw. May 1985, pp. 44.
19. Simulation of Snow Depth in the Forest. By Ming-ko Woo and Peter Steer. May 1985, pp. 13.
20. Recent Developments in Eastern Cree Leadership. By Richard J. Preston. May 1985, pp. 18.
21. I Was Never Idle: Women and Work: Moosonee and Moose Factory, Ontario. By Jennifer M. Blythe, Peggy M. Brizinski, and Sarah C. Preston, June 1985, pp. 226.

MEMORIAL UNIVERSITY OF NEWFOUNDLAND
ST. JOHN'S, NEWFOUNDLAND

General information

Memorial University of Newfoundland, St. John's Newfoundland, Canada A1C 5S7 (709-737-8000) has 9,843 full-time undergraduates, 1,944 part-time undergraduates, 480 full-time graduate students and 568 part-time graduate students. Off Campus Courses and TV or other Distance Education, 1,650.

The major faculties and professional schools are Faculty of Arts, Faculty of Business Administration (Cooperative Program), Faculty of Education, Faculty of Engineering and Applied Science (Cooperative Program), Faculty of Medicine, Faculty of Science, School of Continuing Studies and Extension, School of General Studies, School of Graduate Studies, School of Music, School of Nursing, School of Physical Education and Athletics, School of Social Work.

Sir Wilfred Grenfell College

The Sir Wilfred Grenfell College in Corner Brook on Newfoundland's west coast was opened in 1975 to provide first and second year courses to students of the region. The college complex houses administrative, academic and recreational sections, a student residence, dining hall and bookstore on a 185-acre site. A degree program in fine arts is in the process of being established at Grenfell College. During the winter semester of 1986, 839 full-time students registered at the college.

Northern studies

The size and population of the province of Newfoundland, the fact that Memorial is its only university, and a deliberate policy within the institution of fostering programs and research of particular regional interest, all mean that the north plays a very substantial role at Memorial. In this context Labrador can be perceived simply as a part of Memorial's constituency. Much of the university's activity in Labrador occurs through its specially created Labrador Institute of Northern Studies (LINS) in Goose Bay. Some northern interests may be based in specific programs directed to native Labradorians, and other activities of interest may be derived from more general programs that also have a specific application to the particular needs of Labrador.

The projects, programs, and research included here are not intended to form a complete list of Memorial University's involvement in northern studies. Rather, they exemplify and reflect an interest in the northern section of the province that extends into many departments and divisions, and a concern for the welfare of Labrador that has sparked a wide variety of special activities.

Labrador Institute of Northern Studies

Ms. Carol Brice-Bennett, Director
Labrador Institute of Northern Studies
P.O. Box 309, Station A
Goose Bay, Labrador
A0P 1S0

LINS was created by Memorial in 1979 as a co-ordinating body for northern studies, northern training and northern programs, though the university had been involved in research in the north for many years. The purpose of the institute is to stimulate, co-ordinate and support major university projects or programs designed to promote the well-being of the people of Labrador and enhance our knowledge of Labrador. The institute solicits and accepts funds from the university, foundations, governments, industry and other organizations or individuals for carrying out projects or programs. LINS is the focus of the university's presence in Labrador and as such it has been involved in a remarkable range of activities.

The institute maintains a centre in Goose Bay which offers laboratory, study, conference and seminar space, and has audio and video equipment available for use. In 1983 it opened the Labrador Institute of Northern Studies Information Centre (LINSIC) housing an extensive collection of material relating to Labrador. The Art Gallery in the LINS building is used as a showplace for native crafts and art. Moreover, the presence of the gallery has meant that some shows originate in Labrador and travel elsewhere, such as the well-known Grass Works of Labrador. This exhibit not only came to the island portion of the province, but also travelled to other parts of Canada and to the Smithsonian Institution in the United States. The LINS headquarters has also been the location for over 100 conferences, workshops and seminars — some of local concern, others of international stature.

The LINS facility is also involved in many of the educational and training programs listed elsewhere. The range of the institute's activities is so wide because it serves both the formal academic side of Memorial University through the offering of credit courses and innovative programs such as the Resource Technician Training Program or its role as a research centre (see LINS Projects), and also the less formal role of community participant and catalyst.

While there is the single multi-purpose establishment of LINS focused mainly on Labrador oriented activities, strong interest in the north is also found in many other units at Memorial such as:

Centre for Cold Ocean Resources Engineering

Dr. J.I. Clark, Director
Captain Robert A. Bartlett Building
Memorial University of Newfoundland
St. John's, NF
A1B 3X5
Telephone: 737-8350

The Centre for Cold Ocean Resources Engineering (C-CORE) is an engineering research centre at Memorial that is funded by industry and government. Its applied research programs in ice, icebergs and seabed studies take its field research to cold environments.

Sound management and safe operations in cold waters require efficient access to comprehensive data sources, and to this end C-CORE operates the Ocean Engineering Information Centre (OEIC). Developments in computer based communications and information networking allow economical data transmission of ocean related information over long distances. The C-CORE Canadian Sea Ice Guide is a user friendly data base with access to a large number of data sources.

The centre provides a Canadian base of expertise in cold ocean work by training engineers and scientists to be competent to work in a cold ocean environment. In addition it provides work experience in the same area for undergraduate students and supports graduate students working on ocean related projects through fellowships.

Institute of Social and Economic Research

Dr. J.D. House, Research Director
Queen's College
Memorial University of Newfoundland
St. John's, NF
Telephone: 737-8156

The Institute of Social and Economic Research (ISER) supports both basic and applied research, sponsors seminars and publishes research material about Newfoundland and Labrador and other regions of comparable interest. Since its inception, ISER has spurred much important northern research.

The School of Continuing Studies and Extension

Dr. David Kirby, Dean
Memorial University of Newfoundland
St. John's, NF
A1B 3X8

When it comes to Labrador, one of the school's most important functions is the offering of both credit and non-credit courses. Because of the distances and isolation involved in many of the province's communities, Memorial uses a variety of techniques in the delivery of course material to students, including correspondence, teleconferencing, in-person instruction, video and sometimes a combination of these methods.

Faculty of Medicine

The Faculty of Medicine has a number of roles it plays in Labrador. Several of its research projects either relate directly to Labrador or include the interests and concerns of Labrador. Three hospitals in Labrador and northern Newfoundland have formal affiliations with Memorial's Faculty of Medicine: The Jackman Memorial Hospital in Labrador City, and, through the Grenfell Regional Health Services Board, the Curtis Memorial Hospital, St. Anthony and the Melville Hospital, Goose Bay.

Through the Telemedicine Centre and the Centre for Offshore and Remote Medicine the faculty is helping to deal with some of the problems of distance and isolation.

Telemedicine Centre

Ms. Erin Keough
Manager, Telemedicine
Faculty of Medicine
Memorial University of Newfoundland
St. John's, Newfoundland
Telephone: 737-6654

The teleconference system is operated by the university's Faculty of Medicine. The majority of communities in Labrador are included in the communication link to the St. John's campus of the university. The first of its kind in Canada, the system began operations in 1979, and in 1984 celebrated a major expansion of its Labrador service. It is used by a large number of health and education groups for teaching and administrative purposes, and more recently for medical care, including the transmission of medical data. For the Division of Continuing Studies it is an important method of delivering courses to remote communities.

The system makes it possible for a specialist in St. John's to study medical data from a sick child in a distant northern community, for individuals in such locations to improve their educational qualifications through a course on the teleconference network or for others to hold a meeting with colleagues in other parts of the province.

Centre for Offshore and Remote Medicine

Dr. A.M. House
Director, MEDICOR
Faculty of Medicine
Memorial University of Newfoundland
St. John's, Newfoundland
Telephone: 737-6645

The Centre for Offshore and Remote Medicine (MEDICOR) was established in 1982 and is involved in research and development related to all health aspects of offshore petroleum development, as well as of other industries with remote operations such as fishing or mining.

MEDICOR conducted a major study on occupational health in the offshore industry for the Royal Commission on the Ocean Ranger Marine Disaster. It also offers continuing education courses for rig medics and physicians in offshore and remote medicine. An offshore health database pilot project is currently being established.

MEDICOR acts in a consulting and advisory capacity to the Canadian Oil and Gas Lands Administration and to the Newfoundland Petroleum Directorate.

Newfoundland Institute for Cold Ocean Science

Dr. Richard Haedrich, Director
NICOS
Memorial University of Newfoundland
St. John's, Newfoundland
Telephone: 737-8833

NICOS was created in 1979 to co-ordinate and promote scientific knowledge and studies related to the development and exploitation of the cold oceans of importance to Newfoundland and Labrador. It is a multi-disciplinary institute that has a mandate to promote, sponsor and supervise research within its disciplines, and includes research activities in physical oceanography and ecology of the Newfoundland and Labrador ocean environment, sea ice and iceberg dynamics, marine natural products — marine biochemistry, and studies of marine mammals and seabirds.

Division of Continuing Studies

Mr. Malachy Mandville, Director
Division of Continuing Studies
School of Continuing Studies and Extension
Memorial University of Newfoundland
St. John's, Newfoundland
Telephone: 737-8700

Approximately 70 students in Labrador centres are registered with the Division of Continuing Studies during the winter semester, 1986. The division offers courses on the teleconferencing network in the following Labrador communities: Cartwright, Forteau, Hopedale, L'Anse Au Loup, Makkovik, Mary's Harbour, Nain, Port Hope Simpson, Rigolet, Goose Bay and Labrador City. Degree credit courses are from the faculties of arts, education and science, and during the current winter semester included one course in business, two in education, one in psychology and one in English. Certificate credit courses in communications and financial accounting were also available through the division. In addition, there are 25 courses available by correspondence (see Distance Education section of this volume).

Faculty of Education

Dr. D.B. Sharpe, Director
Division of Special Programmes
Memorial University of Newfoundland
St. John's, Newfoundland
Telephone: 737-7551

The Faculty of Education puts an important emphasis on the education of teachers to serve native and northern schools. It has an extensive list of course offerings directly concerned with northern education. Provision is made for interested students to acquire the practical teaching experience required for their programs to spend time in Labrador schools.

Through its Division of Special Programmes it offers teacher education programs related to northern and native education both in Labrador and, when demand is sufficient, at the St. John's campus. The division also acts as a liaison for the funded students who are on campus under a federal-provincial funding agreement for native students. The office handles the students' funding and is available for counselling. In addition, a room is made available for the students' use.

Centre for Earth Resources Research

Dr. C.R. Barnes, Acting Director
CERR
Department of Earth Sciences
Memorial University of Newfoundland
St. John's, Newfoundland
Telephone: 737-8142

The Centre for Earth Resources Research (CERR) was established in 1983. The centre promotes, initiates and coordinates research within the earth resources discipline and with particular reference to Newfoundland and Labrador and contiguous regions. The centre is an integral part of the Department of Earth Sciences. There is increasing collaboration with government and industry in large research projects that emphasize earth resources. Research in Labrador is an important part of its work.

Marine Sciences Research Laboratory

Located at Logy Bay close to St. John's, the Marine Sciences Research Laboratory represents another aspect of Memorial's interest in the North Atlantic region. Among its research interests are: seal and fish behavior, aquaculture and fisheries, parasites, endocrinology, invertebrate biology, biological oceanography, physiology, and toxicology and pathology. Its various facilities have been used by faculty and graduate students of nearly all the science oriented departments of the university, as well as numerous scientists from other universities and from government.

Institute for Marine Dynamics

Though it is not a part of Memorial, the National Research Council's new Institute for Marine Dynamics is located on the university campus. The site was chosen because of Memorial's existing marine research expertise particularly in relation to Canada's cold northern waters. The $55 million facility was built to enable naval architects, oil companies and governments to ensure that the marine structures they build will be efficiently and safely designed, and suited to their environments.

Selected northern courses

The following is a selected list of undergraduate courses relating to northern studies taken from the 1985-86 Memorial University of Newfoundland calendar.

Labrador Society and Culture
Applied Anthropology
Society and the Sea
Regional Studies: Contemporary Native Peoples of Canada
Regional Studies: North American Indians and Inuit
Prehistory of the New World
Historic Archaeology of Eastern North America
Advanced Newfoundland Ethnography
Newfoundland and Labrador Prehistory
The Structure and Problems of the Newfoundland Economy
Basic Fisheries Economics
Newfoundland Society and Culture
Newfoundland Folklore
Folklore in the Community Context
Geography: The Newfoundland Space Economy
Lands and Seas of the Northern North Atlantic
Regional Geography of the Arctic
Regional Geography of the USSR
Historical Geography of Newfoundland
A History of Canada's Native Peoples
North Atlantic History since 1820
Maritime History of the North Atlantic to 1850
Maritime History of the North Atlantic From 1850
Structure of Inuttut I

Structure of Inuttut II
Structure of Montagnais I
Structure of Montagnais II
Language in Newfoundland and Labrador
Linguistic Introduction to Inuttut
Linguistic Introduction to Montagnais
Public Policy in Newfoundland
Boreal Flora
Boreal Ecology
Glacial Geomorphology
Education in Native and Northern Communities
Teaching English as a Second Language
Teaching Strategies in Native Schools
Teaching Strategies in Culturally Integrated and Geographically Isolated Schools
Administration and Supervision in Native and Northern Education
Supervised Practice Teaching in Native Schools I
Supervised Practice Teaching in Native Schools II
Communication Skills and Techniques in a Cross-Cultural Environment
Creative Arts
Native Literature
History of Native and Northern Education in Canada
Education in Minority Groups
Curriculum and Instruction in Native and Northern Schools I
Curriculum and Instruction in Native and Northern Schools II
Seminar: Current Issues in Native and Northern Education
Physical Education: Outdoor Activity
Community Health Nursing
Transcultural Health Care (Nursing)
Nurse Midwifery
Social Welfare Policy and Services of Newfoundland

Northern programs

Resource Technician Training Program

Terry Lamarre, Director
Resource Technician Training Program
North West River, Labrador A0P 1M0

LINS instituted this post-secondary program in 1984 when over 30 young Labradorians began the two-year training program for resource technicians. The program is intended to qualify its graduates for work in the resources area either with the public or private sector. The program is based in North West River and has a dormitory for the many students who are not from North West River, but from places as distant as Nain on Labrador's northern coast and L'Anse au Loup in southern Labrador. The training provides technical and managerial skills in land use, forestry, fire control, surveying, water management, fisheries and wildlife.

Extension Service Program

Ms. Laura Jackson
Program Developer, Extension Service
Labrador Institute of Northern Studies
Memorial University of Newfoundland
P.O. Box 309, Station A
Goose Bay, Labrador
A0P 1S0

Just as in other parts of the province, the Extension Service of Memorial, long known for its innovative expertise in reaching people, offers a variety of programs throughout each year.

In Labrador, its efforts are a combination of bringing to the northern area the same services as they do elsewhere in the province and of emphasizing the special aspects of the region.

The overall objectives of the Labrador office involve: the development of local research and resource management capabilities, providing information programs for producer co-operatives, the delivery of formal and non-formal educational programs, fostering knowledge of Labrador society, culture, history and environment, and assessing educational and training needs in Labrador with an eye to developing leadership, communications and organizational skills. Courses offered by Extension in Labrador include both certificate courses, such as criminal procedure and the administration of criminal justice, and general interest type courses.

Extension also organized Labrador's first Elderhostel program that featured a special emphasis on regional identity.

Outpost Nursing Program

The School of Nursing at Memorial offers a challenging program in community and primary health care nursing and nursing mid-wifery to better prepare registered nurses for this aspect of their profession. It is committed to meeting the health needs of people living in rural and isolated areas, and includes a six-month clinical rotation prior to graduation. This course was developed with the Grenfell Regional Health Services Board and staff.

First Year Courses in Labrador City

For over a decade with the help of private sector funding, students in Labrador City were able to do their first year of university courses without leaving Labrador. Over 300 students graduated during the first ten years of the program's operation. Though the funding has been withdrawn, the Division of Continuing Studies continues to make a selection of courses available to students in Labrador City.

Teacher Education Program in Labrador

Dr. Brigitte Schloss and Dr. Dennis Sharpe
Division of Special Programmes
Faculty of Education
Memorial University of Newfoundland
St. John's, Newfoundland
Telephone: 737-8616

Two distinct and separate programmes are offered (see Teacher Education Section of this volume):

1. The Teacher Education Programme in Labrador (TEPL) is offered by the Division of Special Programmes, Faculty of Education, to prepare native teachers for work in designated native schools in Labrador which are attended by Innu and Inuit/Settler children. All of the courses are offered in Labrador and the students work in local schools. The

majority of the TEPL students are married women who have children of their own attending school. Typically, two courses are offered each semester to each of the Innu and Inuit/Settler groups. It takes a total of 20 credit courses to successfully complete the program and acquire the Diploma in Native and Northern Education.

2. The Memorial University Native and Northern Teacher Education Programme (MUNNTEP), is offered on the St. John's Campus for any students who have been admitted to the Faculty of Education and who are interested in teaching in Labrador. Twelve courses beyond an education degree are required to complete this diploma.

Municipal Administration Course in Labrador

Don Balsom
Division of Continuing Studies
School of Continuing Studies
Memorial University of Newfoundland
St. John's, Newfoundland
Telephone: 737-8478

A certificate course is currently in progress for municipal clerks in Labrador under the Division of Continuing Studies and Extension. This course, *Introduction to Local Government*, introduces its students to the development of municipal government in Newfoundland and comparative municipal structures in Canada. The community clerks have been involved in a specially designed program since 1982. This program is funded by the Canada/Newfoundland Community Development Subsidiary Committee and co-ordinated by the Public Service Commission of Newfoundland and Labrador. Fifteen clerks from 15 Labrador communities are enrolled in the course. Print materials, including a specially prepared manual, and an introductory videotape are part of the instructional materials. The two-day seminars are held in Goose Bay in February and March, and two teleconference tutorial sessions are held in January and April. Assignments are submitted by mail and examinations conducted using local invigilators.

Newfoundland Studies

Dr. S. McCorquodale
Program Supervisor for Newfoundland Studies
Department of Political Science
Memorial University of Newfoundland
St. John's, Newfoundland

Newfoundland Studies is a multi-disciplinary minor program offered to candidates for the BA degree. The objective of the program is the study of provincial society and culture through a variety of disciplinary approaches, rather than the concentration upon a single discipline. Participating departments include economics, English, folklore, geography, linguistics, history, political science, religious studies and sociology/anthropology.

Northern conferences, workshops and training (LINS):

— The Labrador Institute hosted, organized and participated in the second workshop of the Dag Hammarskjold Foundation project, *Methods and Media in Community Participation.* Fifty delegates attended from 20 Third World nations. There were also six Indian and Inuit representatives from northern Canada who attended the workshop which was held in North West River and Goose Bay.

— Staff of the institute provided training to the trainees of the Okalakatiget Communications Society for its Northern Access Broadcasting Program.

— LINS organized and conducted a training workshop for native women.

— LINS hosted and participated in the Labrador Development Conference sponsored by the provincial Department of Rural Agriculture and Northern Development.

— The staff of the Labrador Institute participated in and were resource persons at the Labrador Inuit Association Fisheries Conference.

— The institute provided video support for a conference at Sheshatshit on the impact of low level flying in Labrador, sponsored by Project North.

— The Fish Producers Co-operative Education Program was organized on the Labrador coast by the institute.

Northern research projects

— Dust study, Labrador City — The prime objective of the study was to assess the medical well-being of the iron industry work force and the residents of Labrador West in relation to the occupational and environmental dust conditions. (Dr. John Martin, Medicine)

— Native Imported Food Use — The study assessed the use and importance of wild food such as fish, game and plants, and the supply of imported foods in terms of quantity, quality, year-round availability, cost, distribution and nutritive value. (Dr. Robin Orr, Medicine)

— Social and economic evaluation of the Labrador Coast — The coast's socio-economic conditions were profiled providing an initial environmental evaluation.

— Nutrition Education Project — The project's goal was to develop a nutrition education model for residents on the Labrador coast who have become more dependent on imported food in recent years.

— The Advisory Committee on Northern Development in Ottawa granted $36,000 for northern scientific training grants for 12 graduate students at Memorial University to help defray the field costs of northern research. The funds are administered through the Department of Indian and Northern Affairs. (Dr. Robert Rogerson, Geography/Earth Sciences)

— LINS received $5,000 from the Naskapi-Montagnais Innu Association for a project to salvage and computerize 400 Innu land use maps.

— The Labrador Institute and the Institute of Social and Economic Research collaborated on research for the Royal Commission on Seals and Sealing.

— A study done in the Faculty of Medicine concerning the correlation of blood pressure with electrolyte excretion in the urine was part of an international study called INTERSALT. Contacts: Dr. George Fodor, associate dean of community medicine, Memorial, and Dr. Peter Roberts, Grenfell Regional Health Services.

— The Prevalence of Markers of Hepatitus A and B in Newfoundland and Labrador by Dr. Samuel Ratnam et al.

— A study to determine the prevalence of dental health behaviors and the prevalence of dental disease among 6-7 and 12-14 year old native and non-native school children living in Labrador and the remote areas of Newfoundland. Contact: Dr. S. Doshi, Director of Community Dentistry, Department of Health.

— Collection of Labrador Historical Materials — LINSIC

— *A Survey of Labrador Material in Newfoundland and Labrador Archives.* This is a LINS publication that is a guide to almost 800 collections containing Labrador archival material in different parts of the province.

— Sea Ice Dynamics — The formation, movement and break-up of the Labrador Sea ice pack. C-CORE will undertake a program to identify and resolve key technological problems impeding the successful development of forecast models. An extension of this work will be to investigate the influence of the Labrador Sea ice pack on iceberg migration south to the Grand Banks. The Dynamic Iceberg and Grounding Experiment (DIGS '85) studied the processes and dynamic behavior of icebergs when they ground and scour the seabed. A second project measured the motion of bergy bits and growlers (small icebergs) in a variety of sea states. This work in the Labrador Sea was conducted from a base camp on the coast of Labrador.

— Ice and Iceberg Detection — C-CORE's radar program undertakes field programs in the Labrador Sea. The radar program is developing a system for ice and iceberg detection.

— C-CORE planned a 1986 summer field program that proposed to use an offshore island in Labrador to simulate an offshore drilling rig. Other northern field programs which the centre conducted in 1985 were a study of ice structure interaction in the Beaufort Sea, and a study on the microstructure of sea ice at Pond Inlet, North West Territories.

— Basque Whaling in 16th Century Labrador — The combined efforts of the Archaeology Unit of the Department of Anthropology at Memorial and Parks Canada's marine excavation unit have brought to light an exciting chapter in the history of Labrador that had been hidden in the isolated community of Red Bay. The five-year project brought up to 60 marine and land archaeologists to Red Bay each summer. Dr. James Tuck, head of Memorial's Archaeology Unit, who is one of the key figures in the Basque investigation, has made a number of other major contributions to modern knowledge of the history and prehistory of Labrador in earlier research projects.

— Torngat Mountains Glaciers Project — A project aimed at understanding the relationship between climate and glacier mass-balance on four small glaciers in the Torngat. Dr. Robert Rogerson of the Departments of Geography and Earth Sciences is also mapping the glacial geology of the Nachvak Fiord area. Since 1981 between two and six students have worked with him in the field during the summer.

— Dr. A.E. Aksu — Marine geology, neogene and quaternary paleoclimatology and paleoceanography: paleoclimatic and oceanographic evolution of the Labrador Sea and Baffin Bay during the last 25 million years (leg 105 of the Ocean Drilling Program).

— Dr. R.N. Hiscott — Clastic sedimentology: Sedimentology and lithostratigraphy of neogene and quaternary sediments as part of the study of the paleoclimatic and oceanographic evolution of the Labrador Sea and Baffin Bay during the last 25 million years (leg 105 of the Ocean Drilling Program).

— Dr. A.P. Nutman — Studies of the North Atlantic Archaean Craton: Study of earliest Archaean crustal genesis in the Saglek — Hebron area, northern Labrador, and the subsequent reworking of these rocks deep in the crust in the late Archaean.

— Dr. T. Rivers — Metamorphic petrology and Precambrian crustal evolution: Crustal development during the Precambrian including the structural development, metamorphic petrology and geochronology of Archaean and Proterozoic rocks in the Nain, Grenville and Churchill areas of Labrador.

— Dr. D.H.C. Wilton — Mineral Deposits: Metallogeny of the Central Mineral Belt, Labrador with emphasis on uranium, molybdenum and precious metals.

— Continental shelf and shelf break program. A model of topographic modification of the flow of field at low frequencies is being applied to the Labrador Shelf. A numerical model of sea-ice transport on the Labrador Shelf has been modified to forecast ice movement.

— NICOS developed a numerical model of wind-driven circulation in Lake Melville.

— J.C. Kennedy of anthropology is at work on a book tentatively titled *People of the Woods and Woodlands: A Regional Study of S.E. Labrador.*

— The role of interpersonal play in Inuit society is the subject of J.L. Briggs, anthropology. She is also working on word and postbase dictionaries of the Cumberland South and Utkuhikhalingmuit dialects of Inuktitut.

— A biography of Sir Wilfred Grenfell is the work of R.G. Rompkey.

— Sheshatshiu Kabgyage Variation — social factors. Labrador Innu Genealogical Analysis (A. Tanner, anthropology).

— Sheshatshiu Sociolinguistic Variability Project (Dr. Sandra Clarke, head of the Department of Linguistics). The Memorial linguistics faculty has a long tradition of working on native languages of the province and has acquired a wealth of data.

Selected northern publications

A selected list of the publications of the Institute of Social and Economic Research and the Labrador Institute of Northern Studies demonstrates the range of interests encompassed in the work of these two organizations.

Labrador Institute of Northern Studies:

Richard Budgel *A Survey of Labrador Material in Newfoundland and Labrador Archives.* (1985)
Tony Williamson *Initial Social and Economic Evaluation of the Labrador Coast.* (1980)
Mary Mackey *The Birthing of Nutrition Education in Labrador.* (1983)
Sadie Popovitch (Editor) *Labrador in the Eighties.* (1980)
Bruce Boles, Mary Mackey, Lawrence Jackson *Breaking the Ice.* (1983)
Lawrence Jackson (Editor) *Bounty of a Barren Coast.* (1982)
Labrador West Dust Study (12 volumes). (1982)
Labrador Food Availability Study. (1984)

Institute of Social and Economic Research:

Robert Paine *Patrons and Brokers in the East Arctic.* (1971)
Georg Henriksen *Hunter in the Barrens: The Naskapi on the Edge of the White Man's World.* (1973)
John Kennedy *Holding the Line: Ethnic Boundaries in a Northern Labrador Community.* (1981)
Cynthia Lamson *Bloody Decks and a Bumper Crop:* The Rhetoric of Sealing Counter Protest. (1979)
Robert Paine (ed) *The White Arctic:* Anthropological Essays on Tutelage and Ethnicity. (1977)
David Zimmerly *Caine's Land Revisited:* Culture Change in Central Labrador 1775-1972. (1975)
Robert McGhee *Beluga Hunters:* An Archaeological Reconstruction of the History and Culture of the Mackenzie Delta Kittegaryumiut. (1974)
Milton R. Freeman (ed) *Intermediate Adaptation in Newfoundland and the Arctic:* A Strategy of Social and Economic Development. (1969)
Shmuel Ben-Dor *Makkovik:* Eskimos and Settlers in a Labrador Community. (1966)
Guy Wright *Sons and Seals.* (1984)

Northern specialists

Bajzak, Denes (Engineering and Applied Science)
Barnes, Christopher R. (Earth Sciences)
Barrie, Vaughn (C-CORE)
Bartels, Dennis A. (Anthropology)
Beaton, Sherilyn (C-CORE)
Brassard, Guy R. (Biology)
Brice-Bennett, Carol (Anthropology/LINS)
Briggs, Jean (Anthropology)
Chari, T. Ramanuja (Engineering and Applied Science)
Christian, Denny (C-CORE)
Clarke, Sandra (Linguistics)
Collins, William (C-CORE)
Cox, Albert R. (Medicine)
Diemand, Deborah (C-CORE)
Donnelley, Rod (C-CORE)
Fitzgerald, G. William N. (Curtis Memorial Hospital, St. Anthony)
Fryer, Brian J. (Earth Sciences)
Gillespie, Randy (C-CORE)
Hanrahan, Leo (LINS)
Harmon, Joy (C-CORE)
Herbert, Pearl (Nursing)
Hewson, John (Linguistics)
Hickey, Ken (C-CORE)
Hiller, James (History)
Hooper, Robert G. (Biology and NICOS)
House, J.D. (Sociology)
Huculak, W. (Nursing)
Jackson, Laura (Extension)
Jeans, Phil (C-CORE)
Johnson, Gordon J. (Community Medicine and Surgery)
Kennedy, John (Anthropology)
Klein, Ken (C-CORE)
MacKenzie, Marguerite (Linguistics)
Martin, Antonio M. (Biochemistry)
Nesbitt-Friis, Eleanor (C-CORE)
Nowak, W.S.W. (Geography)
Paine, Robert (Anthropology)
Parsons, Bruce (C-CORE)
Pereira, Chris (C-CORE)
Reimer, Ernie (C-CORE)
Rivers, Toby (Earth Sciences)
Roberts, Peter J. (Grenfell Regional Health Services)
Roche, Chantal (C-CORE)
Rogerson, Robert J. (Earth Sciences and Geography)
Ruck, Chris (C-CORE)
Schloss, Brigitte (Education Special Programs)
Simms, Alvin (C-CORE)
Snyder, Harold L. (C-CORE)
Stander, Ed (C-CORE)
Steele, Donald (Biology)
Tanner, Adrian (Anthropology)
Toumishy, Hope (Nursing)
Tuck, James (Archaeology/Anthropology)
Whitten, Derek (Earth Sciences)
Whittick, Alan (Biology)
Whittick, Judith (C-CORE)
Williamson, Tony (Don Snowden Centre for Development Support Communications)
Winsor, William D. (C-CORE)
Woodworth-Lynas, Chris (C-CORE)

UNIVERSITÉ DE MONTRÉAL
MONTRÉAL, QUÉBEC

Introduction

Ce document sur l'enseignement et la recherche nordique et autochtone à l'Université de Montréal contient des informations sur les Départements, Facultés et Écoles qui sont énumérés ci-dessous:

Faculté de l'aménagement
Département d'anthropologie
Département de démographie
Département de géographie
Département de géologie
Département d'histoire
Département de linguistique et de philologie
Département de mathématiques
Faculté de musique
École d'optométrie
Département de sciences biologiques

Les Départements et Facultés de criminologie, éducation physique, études anciennes et modernes, médecine dentaire, pathologie, pharmacie, sciences infirmières et sociologie ne dispensent aucun enseignement nordique et autochtone et ne sont le lieu d'aucune recherche dans ces domaines. Les informations relatives aux autres Facultés et Départements de l'Université ne sont pas incluses dans le document parce qu'elles n'ont pu être recueillies. Enfin, un document à part a été préparé pour décrire les activités nordiques de l'École Polytechnique, affiliée à l'Université de Montréal, et qui possède un centre d'ingénierie nordique.

Coordonnées de l'université

Université de Montréal
2900, boul. Edouard-Montpetit
C.P. 6128, Succursale "A"
Montréal (Québec)
H3C 3J7 (514) 343-6111

Clientèle étudiante

Automne 1985

	Plein temps	**Temps partiel**	**Rédaction de thèse**	**Total**
1^er cycle	13978	13106	—	27084
2^e cycle	2969	1310	1721	6000
3^e cycle	866	280	709	1855
TOTAL	17813	14696	2430	34939

Facultés

Faculté de l'aménagement
Pavillon 5620 av. Darlington

Faculté des arts et des sciences
Pavillon Lionel-Groulx

Faculté de droit
Pavillon Maximilien-Caron

Faculté de l'éducation permanente
Bureaux principaux
3333 ch. Queen Mary, 6^e étage
3335 ch. Queen Mary, rez-de-chaussée

Faculté des études supérieures
2910, boul. Edouard-Montpetit

Faculté de médecine
Pavillon principal

Faculté de médecine dentaire
Pavillon principal

Faculté de médecine vétérinaire
3200 rue Sicotte, Saint-Hyacinthe (Québec) J2S 2M2

Faculté de musique
Pavillon de la Faculté de musique

Faculté de pharmacie
Pavillon principal

Faculté des sciences de l'éducation
Pavillon Marie-Victorin

Faculté des sciences infirmières
Pavillon Marguerite-d'Youville

Faculté de théologie
3034, boul. Edouard-Montpetit

Organisation des études nordiques

Les études nordiques à l'Université de Montréal ne forment pas un champ d'étude identifiable à l'intérieur d'unités d'enseignement ou de recherche. Toutefois, quelques Facultés et Départements dispensent des enseignements et font des recherches sur des questions nordiques et autochtones.

L'Université a, depuis une dizaine d'années, un Comité d'études nordiques, dont le mandat est de gérer le programme de subventions du ministère des Affaires indiennes et du Nord canadien.

Principaux outils au service des études nordiques et autochtones

Département de démographie

L'équipe qui traite de l'Analyse démographique des populations autochtones du Canada dispose d'un registre de la population Inuit du Nouveau-Québec qui contient des informations démographiques concernant la grande majorité des Inuit ayant vécu au Nouveau-Québec depuis 1926. Bien qu'anonyme pour des raisons de confidentialité, ce registre n'en contient pas moins une mine d'informations démographiques qui commencent à peine à être exploitées.

Département de géographie

Les divers rapports et documents reçus par le Comité de la recherche nordique de l'Université sont regroupés dans la bibliothèque du Département de géographie: 520, chemin de la Côte-Ste-Catherine, local 339 (tél. 270-3727).

Faculté de musique

Importante collection de bandes de musique Inuit dans les bureaux des professeurs Jean-Jacques Nattiez (tél. 343-7971) et Ramon Pelinski (tél. 343-6428).

Cours nordiques et autochtones

Faculté de l'aménagement

Il n'y a pas de cours dont le contenu est complètement "nordique" ou "autochtone". Néanmoins, les sujets suivants sont étudiés dans le cadre d'ateliers pratiques, de stages et de travaux individuels (sous différents sigles):

- le design de l'unité d'habitation en milieu autochtone nordique (bac. en architecture)
  Jules Auger
  École d'architecture (tél. 343-6809)
- l'aménagement des espaces extérieurs dans les villages autochtones nordiques (bac. en architecture)
  Ronald Williams
  École d'architecture de paysage (tél. 343-6015)
- l'aménagement et la planification des villages autochtones nordiques (bac. et maîtrise en urbanisme)
  Marie Lessard
  Institut d'urbanisme (tél. 343-6724)

De plus, certains cours ont un contenu partiellement nordique ou autochtone:

1er cycle:	APA	4303L	Espaces libres urbains: stratégies d'aménagement régional et stratégies de développement durable dans les villages autochtones nord-québécois Peter Jacobs
	URB	1060	Étude du milieu urbain: conditions de vie et qualité de vie dans les villes du moyen nord québécois Bernadette Blanc
	URB	1110	Élaboration des projets d'aménagement de villages autochtones nord-québécois Marie Lessard
2e cycle:	AME	6050	Les pratiques de l'aménagement: stratégies d'aménagement régional et stratégies de développement durable dans les villages autochtones nord-québécois Peter Jacobs
	AME	6347	Urbanisation et environnement: environnement et conditions de vie dans des villes du moyen-nord québécois Bernadette Blanc
	URB	6351	Dynamique intra-urbaine et intervention: enjeux liés à la planification des équipements dans les villages autochtones nord-québécois; processus et méthodes de planification de ces équipements Marie Lessard

Département d'anthropologie

Les cours thématiques de premier et de second cycle comprennent à la fois des titres réguliers et des séminaires dont le focus varie d'une année à l'autre en fonction des intérêts de l'heure.

Parmi les cours du Département concernant le monde autochtone, il y a:

1er cycle:	ANT	3854	Aire culturelle: Amérindiens et Inuit Rémi Savard
	ANT	3858	Aire culturelle: Andes, Amazonie Lionel Vallée
	ANT	3859	Aire culturelle mésoaméricaine Pierre Beaucage
	ANT	3880	Aire culturelle: Nord-Est américain Norman Clermont
	ANT	3881	Méso-Amérique précolombienne Louise Paradis
2e cycle:	ANT	6129	Autochtones du Canada: dossiers d'actualité Rémi Savard

Département de géographie

Voici la liste et une description des cours qui ont une composante nordique.

2e cycle:	GEO	6546	Milieux arctiques-alpins: interactions terrain climat (100% arctique) James T. Gray

Ce cours met l'accent sur les facteurs du climat et du terrain qui influencent le bilan énergétique à l'inter-face entre l'atmosphère et la lithosphère et, de ce fait, le régime thermique des sols.

GEO	6535	Géomorphologie et quaternaire (30% arctique) Pierre Gangloff

La notion de temps en géomorphologie. La notion d'évolution du relief. Les équilibres morphodynamiques; les ruptures d'équilibres morphoclimatiques; géomorphologie et archéologie: le cas de l'Europe, le cas de l'Arctique canadien.

GEO	6525	Géomorphologie dynamique (50% arctique) James T. Gray

(Nouveau titre au printemps 1987: Télédétection appliquée aux sciences de la terre)

Ce cours sera axé sur les applications de la télé-détection aux études de l'eau, des roches et des sédiments meubles.

Département d'histoire

1er cycle: HST 2380 Amérindiens et Européens en Amérique
J. Dickinson

Le cours examine les cultures amérindiennes précolombiennes et les transformations qu'elles subirent lors de l'arrivée des Européens. Les thèmes abordés comprennent les croyances religieuses, l'organisation socio-politique, l'organisation économique. Il est également question des conceptions européennes de l'Amérique et de ses habitants.

Département de linguistique et philologie

1er cycle: LNG 1150 Linguistique amérindienne
LNG 1170 Cours programmé d'une langue (pendant plusieurs années, a porté sur le montagnais)
LNG 1410 Ethnolinguistique (cours général)
LNG 2090 Description d'une langue (travaux individuels)
LNG 2151 Techniques d'enquête linguistique
LNG 3150 Linguistique du texte amérindien
LNG 3190 Linguistique d'une langue (travaux individuels)

2e cycle: LNG 6930 Séminaire de recherche en linguistique amérindienne

Faculté de musique

L'ethnomusicologie a été enseignée à la Faculté de musique par Charles Boilès de 1976 à 1984 (date de son décès). En 1986-87, l'enseignement est donné sous la forme suivante:

- Histoire et théorie de l'ethnomusicologie, 3 crédits, 1er et 2e cycles, par Jean-Jacques Nattiez.
- Panorama des musiques du monde, 6 crédits, 1e et 2e cycles, par José Evangelista.

Ramon Pelinski offre des cours cycliques (1er et 2e cycles) sur la musique populaire.

Un séminaire de maîtrise sur la musique des Inuit a été donné en 1984-85. Il le sera à nouveau lorsque les effectifs en personnel de la Faculté le permettront.

Département de sciences biologiques

1er cycle: BIO 3839 Écologie des eaux douces (quelques aspects de la limnologie nordique sont traités)
Bernadette Pinel-Alloul

BIO 3892 Aménagement aquatique (cas type: aménagement piscicole des zones riveraines des réservoirs de la Baie de James)
Bernadette Pinel-Alloul

Recherche nordique et autochtone

Faculté de l'aménagement

a) Professeurs-chercheurs

Jules Auger: Habitat autochtone: design et construction
Baie James

Bernadette Blanc: Environnement et appropriation de l'espace
Moyen-nord québécois

Peter Jacobs: Stratégies d'aménagement régional et stratégies de développement durable dans les villages autochtones
Nord du Québec

Marie Lessard: Processus de planification des villages autochtones et évaluation de la qualité de l'environnement dans ces villages
Baie James

Ronald Williams: Aménagement des espaces extérieurs dans les villages autochtones
Baie James

b) Références bibliographiques

AUGER, Jules (1985), Résultats d'une expertise réalisée sur trois maisons de Chisasibi ayant des problèmes de condensation dans l'entretoit durant l'hiver. Rapport de recherche; subventions du C.R.S.H., 11 pages et annexes.

BLANC, Bernadette (1982), Fermont, un nouveau concept de l'habitat, bilan pour les résidents et les organismes locaux. Rapport de recherche S.C.H.L., 119, Annexes, 66 p.

BLANC, Bernadette (1984), Qualité du design et qualité de vie, discours et pratiques: le cas de Fermont 1970-1984. Communication au 4e Colloque biennal sur l'aménagement au Québec, Université de Sherbrooke. Article à paraître dans les Cahiers de l'ACFAS, 1986, 32 p.

BLANC, Bernadette & BOISVERT, Lucie (1985), Urbanism and environment: Case Study of the village of Kuujjuaq and Tassijujjaq (Nouveau-Québec). Northern Science Network Newsletter, August 1985, Vol. 3., n°. 1, UNESCO-MAB. Edmonton, p. 19–20.

BLANC, Bernadette (1985), Technological innovation in town-planning and conditions of life, the case of an isolated, nordic and one-industry-town (Fermont, New-Quebec). IAIA North American Meeting, Calgary, septembre 1985, 19 p.

JACOBS, Peter & KEMP, William (1985), "New Institutions and Adaptive Planning in Northern Quebec". Northern Land Use Planning in Canada; Canadian Arctic Resources Committee, 1986, in press.

JACOBS, Peter & FENGE, Terry (1986), "Integrating Resource Management in Lancaster Sound; But on Whose Terms?. Integrated Approaches to Resource Planning and Management; Reg Lang, Editor; Banff Center, School of Management; Univ. of Calgary Press.

JACOBS, Peter (1986), "Sustainable Landscapes: Sustaining Society", Presentation to the World Conference on Education for Landscape Planning, Harvard University. Landscape Planning. Elsevier Publishing Co., in press.

JACOBS, Peter & CHATIGNIER, Hervé (1986), Proceedings of the Kativik Environment Conference, Kuujuvak, Québec, Kativik Regional Government.

JACOBS, Peter & KEMP, William (1986), "The Tyranny of Leisure: Some Notes on the Concept of Leisure and its Function in Inuit Society". Société et loisirs, O. Soubeyran rédaction, in press.

JACOBS, Peter (1986). "Lancaster Sound Revisited", interview in Northern Perspectives, CARC, Ottawa.

LESSARD, Marie, CHICOINE, Nathalie & OUELLET, Réjeanne (1986), "Le nouveau village de Chisasibi : une évaluation par les résidents". Recherches amérindiennes au Québec. XVI (2 et 3: été-automne: 127-139).

LESSARD, Marie (1985), Environmental Quality of the Cree village of Chisasibi as perceived by the residents (texte de conférence pour le congrès spécial nord-américain de l'International Association for Impact Assessment : septembre 1985, 15 p.

LESSARD, Marie (1986), "Chisasibi. Le point de vue des résidents sur la qualité de leur environnement". Plan Canada, 26 (5): 124-134.

LESSARD, Marie et JUTRAS, Sylvie (1985), Évaluation de la qualité de l'environnement à Chisasibi — données factuelles (texte de conférence présenté au congrès annuel de l'American Planning Association (APA) 15 pages).

LESSARD, Marie et coll. (1984), La qualité de l'environnement perçue par les résidents de Chisasibi — résultats (rapport de recherche; subventions du C.R.S.H.C. et du M.A.I.N., 167 p. : versions française et anglaise).

LESSARD, Marie & JUTRAS, Sylvie (1984), La qualité de l'environnement perçue par les résidents de Chisasibi — élaboration de la problématique et des instruments de recherche. Montréal : pour la S.C.H.L. (207 p.).

LESSARD, Marie (1981), "Chisasibi, une ville nouvelle indienne dans le nord québécois". Métropolis, 48/49: 88-92.

Département d'anthropologie

a) Professeurs-chercheurs

Depuis 25 ans, le Département d'anthropologie a toujours eu des spécialistes intéressés aux groupes autochtones actuels et passés. Ces activités ont porté sur trois champs thématiques: l'ethnologie, l'archéologie et l'anthropologie physique. Le catalogue de cet intérêt comprend à la fois, des études de terrain, des livres, des articles, des travaux gradués, des rapports, etc.

Asen Balikci:

Il fut le premier promoteur des études ethnologiques des autochtones à ce Département. Il s'est spécialisé sur les Inuit de l'Arctique oriental et sa contribution à ce sujet est impressionnante (livre, articles, films, communications diverses, direction de mémoires, etc.). Il a aussi travaillé chez les autochtones de l'Ouest canadien.

Rémi Savard:

Spécialiste du discours mythologique et des activités politiques des groupes algonquiens, il a surtout travaillé chez les groupes montagnais, mais il a dirigé des études actuelles sur les Algonquins de l'Outaouais et reste extrêmement sensible aux grands problèmes de l'articulation des autochtones du Nord-Est aux sociétés industrielles. Il a publié sur ces sujets de nombreux ouvrages.

Norman Clermont:

Archéologue spécialisé sur le développement culturel des Iroquoiens depuis la plus lointaine préhistoire jusqu'à la période du contact. Il a aussi travaillé chez les Attikamek de la Haute-Mauricie et a publié de nombreux ouvrages sur ces deux groupes autochtones.

Louise Paradis:

Archéologue spécialisée sur le développement culturel des civilisations autochtones préhistoriques du Mexique et sur les systèmes de représentation des groupes de la période du contact.

Paul Tolstoy:

Archéologue spécialisé sur le développement de l'état dans la préhistoire du Bassin de Mexico et sur le développement culturel préhistorique des groupes autochtones de l'Équateur.

Claude Chapdelaine:

Archéologue spécialisé sur l'histoire culturelle des autochtones du Québec.

Lionel Vallée:

Ethnologue spécialisé sur les groupes culturels quéchua contemporains du Pérou et de la Bolivie.

Pierre Beaucage:

Ethnologue spécialisé sur les groupes autochtones contemporains au Mexique.

Département de démographie

a) Professeurs-chercheurs

Norbert Robitaille (professeur et responsable)
Robert Choinière (chercheur)

Le Département de démographie a présentement un projet qui s'intitule Analyse démographique des populations autochtones du Canada. Quoique s'intéressant à l'ensemble des Autochtones du Canada, cette recherche a un intérêt particulier pour les Inuit du Nouveau-Québec.

b) Références bibliographiques

CHOINIÈRE, Robert et Norbert ROBITAILLE, 1982, "Description et utilisation du registre de population des Inuit du Nouveau-Québec". Cahiers québécois de démographie, 11 (1): 69-99.

> Cet article a initialement fait l'objet d'une communication au Troisième colloque sur les populations nordiques tenu à Yellowknife en décembre 1981. Dans cette communication, on présentait la structure du registre mis à jour en date du 1977-07-01 à partir des listes de la Convention de la Baie James et du Nord québécois. On présentait également une première estimation des indices sommaires de fécondité et de mortalité des Inuit du Nouveau-Québec à partir d'une compilation manuelle du registre.

CHOINIÈRE, Robert et Norbert ROBITAILLE, 1983. "Évolution démographique des Inuit du Nouveau-Québec, des Territoires du Nord-Ouest, du Groënland et de l'Alaska, de 1930 à nos jours". Études/Inuit/Studies, 7 (2): 125-150.

> Cet article est la version écrite d'une communication présentée à Frobisher Bay en mai 1982 dans le cadre du Quatrième colloque sur les populations nordiques. On y comparait l'évolution démographique des Inuit du Nouveau-Québec à celle des Inuit des autres régions nordiques. Pour les premiers, en plus des taux observés, on présentait des taux corrigés qui tenaient compte du sous-enregistrement des décès et des naissances à l'état civil.

CHOINIÈRE, Robert et Norbert ROBITAILLE, 1985. "Demographic Evolution of the Inuit of Canada" in Committee on Northern Population Research, International Workshop on Population Issues in Arctic Societies, 21-37, Gilleleje, Denmark (2-5 May 1984) 319 p.

> Cet article rapporte les résultats présentés au Colloque international sur les questions démographiques dans les sociétés nordiques tenu au Danemark en mai 1984. Cette communication comparait la fécondité et la mortalité des Inuit des différentes régions canadiennes.

ROBITAILLE, Norbert et Robert CHOINIÈRE, 1984. Aperçu de la situation démographique et socio-économique des Inuit du Canada. Ottawa: Affaires indiennes et du Nord Canada, 116 pages. (disponible également en anglais).

> À partir principalement des données du recensement de 1981, ce document présente les caractéristiques démographiques et socio-économiques des Inuit du Labrador, du Nouveau-Québec, des Territoires du Nord-Ouest et Yukon et du Sud du Canada. Des comparaisons sont établies avec l'ensemble de la population du Canada. Cette étude a fait l'objet d'une présentation au MAINC le 27 septembre 1985.

c) Colloques

ROBITAILLE, Norbert et Robert CHOINIÈRE, 1985. "La croissance des groupes autochtones du Canada au 20e siècle".

> Cet article a été préparé dans le cadre du Congrès des sociétés savantes tenu à Montréal à la fin du mois de mai 1985 et du Congrès international de la population ayant eu lieu à Florence du 5 au 12 juin 1985. On y présentait les concepts reliés à l'appartenance aux différentes origines autochtones ainsi qu'une comparaison de l'évolution démographique des Autochtones entre eux (principalement Inuit et Indiens inscrits) et de la population non autochtone.

ROBITAILLE, Norbert et Robert CHOINIÈRE, 1985. "The Inuit population of Northern Quebec: present situation, future trends" (article soumis à la revue Anthropologica le 06-21-1985).

> Ce document décrit les résultats présentés lors du Colloque sur l'environnement Kativik ayant eu lieu à Kuujjuaq au mois de décembre 1984. Ces résultats portaient sur l'évolution récente de la population inuit du Nouveau-Québec et les différents scénarios possibles de son évolution future.

Le Comité de recherche sur les populations nordiques, dont le secrétariat est au Département de démographie, organise, en collaboration avec l'Arctic Institute of North America de l'University of Calgary, (Canada) et l'Institute of Social Science de l'University of Tromsø, (Norvège), son deuxième colloque international sur les questions démographiques dans les sociétés nordiques. Ce colloque se tiendra du 31 mai au 3 juin 1987 à Tromso. Robert Choinière et Norbert Robitaille présenteront à ce colloque une communication traitant de la Transition démographique chez les Inuit du Nouveau-Québec.

Département de géographie

a) Professeurs-chercheurs

GRAY, James
— Recherches sur le pergélisol et le milieu périglaciaire d'Ungava (1)
— Recherches sur l'histoire glaciaire de l'extrémité nord d'Ungava (2)
— La télédétection et la cartographie écologique et géo-

morphologique dans le nord de l'Ungava.

FOGGIN, Peter — Étude des problèmes de santé chez les autochtones des villages Cri et Inuit du Nouveau-Québec

SINGH, Bhawan — Études micro-climatologiques dans le secteur de Poste-de-la-Baleine, Nouveau-Québec.

(1) En collaboration avec Dr Matti Seppala, de l'Université d'Helsinki en congé sabbatique au Département de géographie de l'Université de Montréal (1987)

(2) En collaboration avec M. Bernard Lauviol, professeur au Département de géographie, Université d'Ottawa.

Département de géologie

a) Professeurs-chercheurs

DAVID, Peter: géomorphologie, quaternaire
BOUCHARD, Michel: surtout dans l'Ungava

LUDDEN, John: géochimie
surtout dans l'Ungava

MAMET, Bernard: Stratigraphie, sédimentologie
Yukon, Alaska, Arctique

Chercheur

PICARD, Christian: platinoïdes de la ceinture de Cape Smith

Département d'histoire

a) Professeurs-chercheurs

DICKINSON, J.: recherches sur les rapports entre blancs et Français dans la vallée laurentienne aux XVI^e^ et XVII^e^ siècles

b) Références bibliographiques

J. Dickinson, "Annaotaha et Dollard vus de l'autre côté de la palissade", Revue d'histoire de l'Amérique française, 35,2 (septembre 1981): 163-178.

J. Dickinson, "La guerre iroquoise et la mortalité en Nouvelle-France, 1608-1666" RHAF, 36,1 (juin 1982): 31-54.

J. Dickinson, "Les Amérindiens et les débuts de la Nouvelle-France" Actes du VI^e^ colloque de l'Association italienne d'études canadiennes (à paraître en 1986).

J. Dickinson, "Old Routes and New Wares. The Advent of European Goods to the St. Lawrence Valley" in Bruce Trigger ed., Proceedings of the 5th North American Fur Trade Conference (à paraître en 1986).

Département de linguistique et philologie

a) Professeurs-chercheurs

MM. Alan Ford, spécialiste de linguistique amérindienne et plus particulièrement du montagnais, du naskapi et du cri, et Gilles Lefebvre, spécialiste de créoles, mais qui a déjà fait des recherches sur l'inuit, sont les professeurs de ce Département concernés par les études nordiques.

b) Colloques: Conférence (annuelle) des algonquinistes qui a lieu dans différentes universités impliquées en linguistique algonquienne. (a déjà eu lieu à l'Université de Montréal)

Département de mathématiques

a) Professeurs-chercheurs

M. Michel Delfour, affecté au Centre de recherches mathématiques, travaille sur des problèmes mathématiques reliés à la conception d'hydroglisseurs pour le Grand Nord.

Faculté de musique

a) Professeurs-chercheurs

Ramon Pelinski: musique des Inuit du Caribou

Jean-Jacques Nattiez: jeux de gorge des Inuit et musique du nord de la Terre de Baffin (Igloolik, Pond Inlet).

b) Références bibliographiques

Disque paru en 1979 consacré aux jeux de gorge des Inuit (Grand Prix International du disque); nombreux articles dans des revues spécialisées publiés par les membres d'une équipe de recherche qui a fonctionné à la Faculté de 1974 à 1980; disque de N. Beaudry (titulaire d'un Ph.D. de la Faculté) sur la musique du Nouveau-Québec; deux livres de Ramon Pelinski sur la musique des Inuit du Caribou.

Département de sciences biologiques

a) Professeurs-chercheurs

PINEL-ALLOUL, B., Ph.D.: Limnologie-Ecosystèmes planctoniques — Baie de James

METHOT, Ginette, M.Sc. Agent de recherche au Centre de recherches écologiques de Montréal (CREM), spécialiste en zooplancton — Baie de James, Côte Nord

GODIN-BLUMER, Gabriella, B.Sc. Agent de recherche au Centre de recherches écologiques de Montréal (CREM), spécialiste en zooplancton —Baie de James, Côte Nord

De plus le Département participe au programme de surveillance écologique des réservoirs du complexe la Grande (1973-1984): Évolution des communnautés zooplanctoniques. Les nord-canadiens étaient employés à titre de guides ou de techniciens.

b) Références bibliographiques

PINEL-ALLOUL, Bernadette et Ginette METHOT. 1984. "Analyse multidimensionnelle de l'évolution du zooplancton durant la mise en eau de trois

réservoirs du Nord du Québec", Verh. Internat. Verein. Limnol. 22: 1444-1455.

PINEL-ALLOUL, Bernadette et Ginette METHOT. 1984. "Étude préliminaire des effets de la mise en eau du Réservoir de LG-2 (Territoire de la Baie James, Québec) sur le seston grossier et le zooplancton des rivières et des lacs inondés", Int. Revue ges. Hydrobiol. 69: 57-78.

PINEL-ALLOUL, Bernadette, MAGNIN, Étienne, GODIN-BLUMER, Gabriella & ROSS, Philippe. 1982. "Zooplankton population dynamics during and after impoundment in a small reservoir (James Bay, Québec)", Canadian Water Resources Journal. Vol. 7. N° 1: 168-185.

PINEL-ALLOUL, B., MAGNIN, E. & GODIN-BLUMER, G. 1982. Effets de la mise en eau du réservoir Desaulniers (Territoire de la Baie de James) sur le zooplancton d'une rivière et d'une tourbière reticulée'', Hydrobiologia. 86: 271-296.

PINEL-ALLOUL, B., LEGENDRE P. et MAGNIN E. 1979. "Zooplancton limnétique de 46 lacs et 17 rivières du territoire de la Baie de James, Can. J. Zool. 57: 1693-1709.

PINEL-ALLOUL, Bernadette. 1979. "Communautés zooplanctoniques d'un petit lac de la radissonie", Naturaliste can. 106: 289-304.

PINEL-ALLOUL, Bernadette et Étienne MAGNIN, 1978. "Zooplancton d'une tourbière réticulée de territoire de la Baie de James'', Naturaliste can. 105, n° 1: 19-35.

Enseignement à distance

Centre audiovisuel

L'enseignement télévisé à l'Université de Montréal

Depuis 1983, le Centre audiovisuel de l'Université de Montréal met à la disposition des professeurs de l'institution les ressources techniques nécessaires à l'enregistrement et à la diffusion de cours télévisés.

Ce service permet aux professeurs de rejoindre deux clientèles:

- les étudiants libres qui ne peuvent fréquenter les salles de cours du campus pour des raisons d'horaire ou de distance;
- les étudiants réguliers qui ne peuvent suivre un cours à l'horaire prévu en salle de cours (cela s'applique particulièrement aux cours d'introduction aux disciplines connexes ou aux étudiants inscrits dans un programme multidisciplinaire).

La préparation

Le recours à ce service est initié par le professeur. Il doit recevoir l'autorisation de son unité académique en fonction des priorités de sa faculté.

Un fois cette autorisation obtenue, le professeur reçoit du Centre audiovisuel les conseils d'un réalisateur et l'appui du Laboratoire de modélisation composé d'un cadre, de deux réalisateurs-pédagogues et d'un illustrateur. Toutefois le contenu scientifique et pédagogique reste entièrement sous la responsabilité du professeur.

L'enregistrement

Tenant compte des ressources disponibles, l'enseignement télévisé de l'Université de Montréal se fait en mode de "vidéo-communication" misant d'abord sur la présence du professeur à l'écran.

> L'enregistrement se fait en studio. L'exposé du professeur est habituellement présenté sous forme de dialogues avec un ou plusieurs interlocuteurs (étudiants ou animateur semi-professionnel).
>
> Cet exposé est appuyé d'illustrations de divers types: diapositives, graphiques ou courtes séquences vidéo de reportage.
>
> Les électrotechniciens du Centre audiovisuel ont développé divers moyens électroniques permettant d'offrir aux professeurs un cadre technique approprié à une bonne communication du contenu de leurs cours tout en respectant "l'austérité" d'une préoccupation universitaire centrée sur la connaissance et non le spectacle.

La diffusion

La participation de l'Université de Montréal au consortium de téléenseignement C.A.N.A.L. Inc. permet aux professeurs de pouvoir diffuser leurs cours:

- sur le canal de téléenseignement des câblodistributeurs dans huit grandes régions urbaines du Québec et de rejoindre ainsi, sur plus de quatre plages-horaires par semaine, près d'un million de foyers
- sur des plages-horaires de week-end à Radio-Québec.

De plus des copies des cours télévisés sont déposées en permanence dans la médiathèque du Pavillon Jean-Brillant et (grâce à une entente particulière avec le Service des bibliothèques de la Ville de Montréal) dans six Maisons de la culture réparties à travers la ville.

L'inscription et l'encadrement des étudiants

Le secrétariat administratif du Centre audiovisuel offre aux unités académiques un lieu centralisé pour l'information (téléphone et courrier) des étudiants libres.

> Les étudiants libres font leur demande d'admission auprès des facultés concernées et les étudiants réguliers, leur choix de cours auprès de leur unité académique.

Les professeurs offrent un système de consultation téléphonique. Certains cours comprennent aussi des rencontres sur le campus.

> Lié par câble bidirectionnel et par antenne avec les câblodistributeurs de la région montréalaise, le Centre audiovisuel offre aussi la possibilité de faire des émissions "en direct"avec interventions téléphoniques des étudiants.

Les étudiants inscrits reçoivent une importante documentation écrite composée de notes de cours et d'exercices.

Tous ces cours donnent lieu à une évaluation pour l'obtention de trois crédits. Cette évaluation se fait par examen ou par travaux écrits.

Les cours

Le Centre audiovisuel peut enregistrer deux à trois cours par année. Il est prévu que la plupart de ces cours seront diffusés pendant trois ans à raison de deux sessions par année.

À ce jour, l'Université de Montréal a diffusé les cours suivants (dans l'ordre d'enregistrement ou de diffusion "en direct"):

- Introduction à l'astronomie générale (physique)
- Environnement urbain (géographie)
- Christianisme et religions du Nouvel Âge (théologie)
- 4 cours du programme d'andragogie
- Sociologie des médias (sociologie)
- Choix et utilisation des médias (certif. en publicité)
- Communication et organisation (communication)

De plus l'Université de Montréal a diffusé six séries de 13 émissions de formation médicale non-créditée.

École d'optométrie

Depuis septembre 1984, un programme spécial d'éducation continue est offert aux optométristes en pratique, gradués de l'École d'optométrie de l'Université de Montréal.

Ce programme de cours, comportant 31 crédits, vise deux objectifs:

1. Une mise à jour des connaissances dans une science de la santé en constante évolution.
2. L'obtention du doctorat en optométrie (O.D.) à tous les optométristes ayant gradué avant 1980 et qui possèdent une licence en optométrie (L.Sc.O.).

Les optométristes québecois étant dispersés aux quatre coins de la province, il fallait trouver une méthode pour rejoindre tout le monde sans trop pénaliser ceux qui pratiquaient dans les régions éloignées.

L'élément visuel étant important (démonstrations de techniques, instruments, etc...), l'École d'optométrie a opté pour l'utilisation de bandes magnétoscopiques (50% du programme de cours et pratiquement 100% des cours comportent un complément vidéo).

UNIVERSITY OF NEW BRUNSWICK
FREDERICTON, NEW BRUNSWICK

General information

University of New Brunswick, P.O. Box 4400, Fredericton, New Brunswick, E3B 5A3 (506-453-4666) has 7,851 full-time undergraduates, 2,279 part-time undergraduates, 460 full-time graduate students and 242 part-time graduate students. The major faculties are: Faculty of Administration, Faculty of Arts, Faculty of Education, Faculty of Engineering, Faculty of Forestry, Faculty of Law, Faculty of Nursing, Faculty of Physical Education and Recreation, Faculty of Science.

Organization of Northern Studies

The University of New Brunswick Northern Canadian Studies Committee Drs. I.R. Methven and R.H. Cockburn, Co-Chairmen.
Contact person: Janice M. Moore, Fire Science Centre, 506-453-4509.

The University of New Brunswick Northern Canadian Studies Committee was formed in 1982: i) to coordinate the research interests of faculty members in the University who have or may have an interest in any aspect of research in the north; ii) to represent the University on the Council of the Association of Canadian Universities for Northern Studies, and; iii) to stimulate teaching efforts in northern studies by publicizing northern activities, promoting courses and inviting knowledgeable speakers to the campus.

The University of New Brunswick has had a long association with the North. Surveying Engineering was involved with mapping of Arctic Islands in northern Canada and the Muskeg Research Institute was a focus for northern studies until Dr. N.W. Radforth resigned. Although the UNB program in northern studies is not large in comparison with other Canadian universities, we do have a number of faculty and students who have worked or are working in the North. A list of UNB specialists follows. There is a concentration of faculty in Surveying Engineering and several faculty members are cooperating within the Fire Science Centre.

Selected northern courses

Several courses have a northern emphasis; for example, Boreal and Arctic Ecology.

Northern research

A major research project centered in northern Canada is the interdisciplinary research study in Wood Buffalo National Park. This cooperative study is coordinated by the Fire Science Centre with 6 faculty members, 15 graduate students and 5 staff from the Departments of Biology, Chemical Engineering, Forest Engineering, Forest Resources, Surveying Engineering and Sociology involved. Subjects being researched include vegetation and animal dynamics, sociological and anthropological aspects of fire as well as the possibility of using remote sensing techniques to up-date existing biophysical data banks (see article in Information Systems section of this volume). In this project we have the cooperation of Parks Canada personnel in Wood Buffalo National Park, as well as personnel from Thebacha College and government (territorial and federal) agencies. We have also had considerable discussions with band councils and hunters and trappers associations. Our UNB Northern Canadian Studies Committee has had considerable support from the DINA Northern Scientific Training Program but most funds have been received from the Natural Sciences and Engineering Research Council of Canada and the Donner Canadian Foundation. Two conferences (October, 1979 — The role of fire in northern circumpolar ecosystems; August, 1982 — The ACUNS conference on dynamics of boreal forest ecosystems: future research and management requirements) have been organized by UNB faculty.

Northern specialists

Name	Department
Chrzanowski, A.	Surveying Engineering
Cockburn, R.H.	English
Davar, K.S.	Civil Engineering
Derenyi, E.E.	Surveying Engineering
Dilworth, T.G.	Biology
Faig, W.	Surveying Engineering
Forbes, E.R.	History
Landva, A.O.	Civil Engineering
Langley, R.	Surveying Engineering
Methven, I.R.	Forest Resources
Nickerson, B.	Surveying Engineering
Pobihyschy, S.I.	Political Science
Szabo, L.	German and Russian
Terhune, J.M.	Biology (St. John campus)
van der Hoonaard, W.C.	Sociology
Vanicek, P.	Surveying Engineering
Vigod, B.L.	History
Wein, E.E.	Vocational Education
Wein, R.W.	Biology
Wells, D.	Surveying Engineering
Whiteford, G.	Curriculum and Instruction

Selected northern publications

Wein, R.W. and D.A. MacLean (eds.). 1983. The role of fire in northern circumpolar ecosystems. SCOPE 18, John Wiley and Sons, Chichester, England. 322pp.

Wein, R.W., R.R. Riewe and I.R. Methven (eds.). 1983. Resources and dynamics of the boreal zone. Association of Canadian Universities for Northern Studies, Ottawa, Ontario. 544pp.

Cockburn, R.H. (ed.). 1985. To Great Slave and Great Bear: P.G. Downe's Journal of Travels North from Ile à la Crosse in 1938. Part I. Arctic 38: 133–145. Part II. Arctic 38: 231–243. Part III. Arctic 38: (In press).

Native Studies

Micmac-Maliseet Research Institute is an externally funded institute of the Faculty of Education which offers degree and other programs in accordance with the expressed needs of the Indian people of the region. It also conducts an Indian cultural resource center within the UNB library system. Phone 506-433-4840.

UNIVERSITY OF OTTAWA/UNIVERSITÉ D'OTTAWA
OTTAWA, ONTARIO

General information

University of Ottawa, 550 Cumberland Street, Ottawa, Ontario K1N 6N5 (613-564-3928) has 11,686 full-time and 6,359 part-time undergraduates, 1,371 full-time and 1,637 part-time graduate students.

The major faculties and professional schools are: Faculty of Administration, Faculty of Arts, Faculty of Law, Faculty of Health Sciences, Faculty of Science and Engineering, Faculty of Social Sciences, Faculty of Education.

Organization of Northern Studies

Northern research at the University of Ottawa is coordinated via the *Northern Research Group* established in 1970 within the School of Graduate Studies and Research. An Advisory Committee consists of the Chairman, the Vice-Chairman, and 5-7 professors appointed annually by the School of Graduate Studies. They represent the range of northern interests present at the University of Ottawa.

For two decades, the University of Ottawa has emphasized northern research and training in *geology*, *geography* and *the physical sciences*. In addition, there is ongoing research in law, life sciences (biology, medicine), linguistics, and sociology.

Chairman Northern Research Group: 1985-86

Dr. H.M. French
Professor of Geography and Geology
(613) 564-6829

Vice-Chairman: 1985-86

Dr. J. Fenwick
Department of Biology
(613) 564-2436

Features of Northern Studies

The Ottawa-Carleton Centre for Geoscience Studies

The Ottawa-Carleton Centre for Geoscience Studies is a joint program of the University of Ottawa and Carleton University. Established in 1982, the centre represents one of the largest graduate teaching and research institutions of earth science in Canada. Members of the centre include 26 full-time professors of geology and geography at the two universities, and 12 adjunct and visiting faculty. The centre offers unparalleled opportunities for research and professional development, through its collaboration with members of the Geological Survey of Canada, and its close proximity to the National Research Council, the Earth Physics Branch and the national museums.

Geoscience studies in the north have been a research emphasis in the University of Ottawa for many years and particular efforts have been made in two clearly distinct fields: (A) studies of Lower Paleozoic and Proterozoic sedimentary rocks, and (B) studies of Geomorphology, including Quaternary geology and cold-climate processes. These are summarized separately below.

(A) Lower paleozoic and proterozoic rocks

The studies of bedrock geology effectively began in 1964 with the first of the field expeditions to the high Arctic that have been repeated annually by members of the Geology Department at the University of Ottawa. Detailed work focussed on a succession of Cambrian to Devonian marine carbonates and terrestrial clastics that are widely exposed in the region of the Boothia Uplift. A common theme has been the unravelling of the lower Paleozoic history of the region through basic but detailed stratigraphic, sedimentological, paleontological and geochemical studies. Since 1964 this program, concentrated in one particular region of the arctic, has produced 5 M.Sc. and 6 Ph.D. theses (4 others are in progress), more than 50 refereed journal publications and more than 40 other communications (published abstracts, papers in conference proceedings, papers in non-refereed publications, etc.).

In addition studies have been conducted at different times on diverse topics across the mainland and archipelago of Arctic Canada. Examples of these include: structural studies of Precambrian rocks in the Slave Province, petrological studies on lapis lazuli deposits on Baffin Island, and others. Largely because of recently available support for particular projects, current work includes areas on Ellesmere Island and the Mackenzie Mountains in the Yukon.

(B) Geomorphology, quarternary geology and cold-climate processes

The study of cold-climate processes and Quaternary geology in the Western Arctic was initiated in 1968 when geography personnel from the University of Ottawa worked in close conjunction with members of the Geological Survey of Canada on Banks Island, N.W.T.

Since then, field programs on Banks Island have been undertaken annually.

By 1975, geomorphological studies had expanded into the fields of Quaternary geology, glaciology and polynology. Areas of research included the High Arctic islands (e.g. Melville, Ellef Ringnes islands), the Pleistocene and modern Mackenzie Delta, and the SW Yukon (St. Elias Mts, Ruby Range). In recent years, this focus has continued to develop with additional studies in the northern interior Yukon. Since its initiation, these combined activities have produced 4 Ph.D., 1 M.Sc. and 12 M.A. theses, more than 50 refereed journal publications and numerous reports of a professional nature.

Selected northern courses

There is no separate degree program oriented to northern studies at the University of Ottawa. However, many courses in both Geography and Geology Departments are heavily oriented towards northern studies.

Ex:	GEG 4001	Northern Canada Field Research (6 credits) Dr. P.G. Johnson
	GEO 4307	Permafrost Geomorphology (3 credits) Dr. H.M. French
	GEG 4100	Glaciology and Glacial Geomorphology (3 credits) Dr. P.G. Johnson
	GEG 4502	Géomorphologie glaciaire (3 crédits) Dr. B. Lauriol
	GEO 2103/ GEG 3306	Quaternary Environments (3 credits) Dr. H.M. French
	GEO 2504/ GEG 4718	Palynologie et les environnements quaternaires (3 crédits) Dr. M.-A. Geurts
	GEO 5152	Geology of Arctic Canada (Grad. course) Dr. O. Dixon

Other areas of northern expertise are in the Department of Linguistics, and the Faculty of Civil Law. Typical courses include:

LIN 2001	Elementary Eskimo (6 credits)
LIN 2002	Cree Language Course (6 credits)
LIN 3004	Intermediate Eskimo (6 credits)
DCL 6753	Legal Status of the Arctic and Antarctic Regions (Graduate Course) — Dr. D. Pharand

Northern scholars

DIXON, Owen A.:	Professor, Department of Geology. Paleontology, Paleoecology, High Arctic
FENWICK, James A.:	Professor, Department of Biology. Arctic Mammals
FRENCH, Hugh M.:	Professor, Departments of Geography and Geology. Permafrost, Western Arctic and High Arctic Islands
GUERTS, Marianne:	Associate Professor, Department of Geography. Palynology, Quaternary Studies, Yukon Territory
JOHNSON, Peter G.:	Professor, Department of Geography. Glaciology, Hydrology, Yukon Territory
LAURIOL, Bernard:	Assistant Professor, Department of Geography. Geomorphology, Glaciology, N. Québec/N. Yukon
LAGAREC, Daniel:	Assistant Professor, Department of Geography. Geomorphology, Climatology. Yukon Territory/N. Quebec
MORSE, Bradford W.:	Professor, Faculty of Law. National Resources Management
PHARAND, Donat:	Professor, Faculty of Law. International Law of Arctic and Antarctic
PHIPPS, Michel:	Associate Professor, Department of Geography. Biogeography, Ecology, Yukon Territory
RIVERO, Maria:	Professor, Department of Linguistics. Syntax, linguistics and philosophy. Native languages
RUST, Brian R.:	Professor, Department of Geology. Sedimentology, Braided Rivers
SPRY, Irene M.:	Professor Emeritus, Department of Economics. Economic Development, Northern Canada

Selected northern references

Books:

1. H.M. French. The Periglacial Environment. Longmans Group Ltd, New York 309 pp (1976).
2. D. Pharand. The Law of the Sea of the Arctic with Special Reference to Canada. Editions de l'Université d'Ottawa, (1973).
3. D. Pharand. The Northwest Passage: Arctic Straits. Martins Nifjhoff Publishers, Netherlands (1984).

Journal articles (1983-85):

1. Bourgeois, J.C. and M.A. Geurts (1983). Palynologie et morphogenese récente dans le bassin de Grizzly Creek (Territoires du Yukon). Canadian Journal of Earth Sciences, 20, 1543-1553.
2. Johnson, P.G. (1984). Rock glaciers formation by high-magnitude low-frequency slope processes in the southwest Yukon, Annals, Association American Geographers, 74, 408-19.
3. Egginton, P.A. and H.M. French (1985). Solifluction and related processes, Eastern Banks Island, N.W.T. Canadian Journal of Earth Sciences, 22, 1371-79.
4. Narbonne, G.M. and O.A. Dixon (1984). Upper Silurian lithistid sponge reefs on Somerset Island, Arctic Canada, Sedimentology, 30, 25-50.
5. Johns, A. (1984). Case assignment and grammatical relations in Eskimo. Cahiers Linguistiques d'Ottawa, 12, 49-87.

Recent PhD. theses:

A.G. Lewkowicz (1981). Slopewash processes in an arctic tundra environment, Banks Island, Canada. Department of Geography.

D.G. Harry (1982). Aspects of the permafrost geomorphology of S.W. Banks Island, Arctic Canada. Department of Geography.

W.H. Pollard (1983). A study of seasonal frost mounds, North Fork Pass, Yukon Territory. Department of Geography.

J.J. Packard (1984). The Upper Silurian Barlow Inlet Formation, Cornwallis Island, Arctic Canada. Department of Geology.

UNIVERSITÉ DU QUÉBEC À CHICOUTIMI, CHICOUTIMI, QUÉBEC

Renseignements généraux

Université du Québec à Chicoutimi (UQAC)
555, boulevard de l'Université
Chicoutimi (Québec)
G7H 2B1

Téléphone: 418-545-5011
Télex: 051-36108

Clientèle étudiante en 1985

	Étudiants		
Cycle	Temps plein	Temps partiel	Total
Premier cycle	2425	4220	6645
Deuxième cycle	123	225	348
Troisième cycle	12		12
TOTAL	2560	4445	7005

Liste des modules, directeurs de module, numéros de téléphones des modules (sécrétariat)

Module	*Directeur*	*Téléphone (secrétariat)*
Sciences fondamentales et appliquées		
Biologie	Christian Cholette	545-5415
Chimie	Jean-Marie Hachey	545-5415
Génie unifié	René Brunelle	545-5204
Mathématiques et informatique	Gilles Gauthier	545-5487
Physique	Michel Suquet	545-5487
Sciences de la santé	Hélène Roy	545-5315
Sciences de la terre	Reynald Duberger	545-5202
Sciences de la société		
Administration	Ghislain Tremblay	545-5236
Affaires sociales	Jean-Pierre Deslauriers	545-5272
Géographie	Majella-J. Gauthier	545-5330
Histoire	André Côté	545-5331
Sciences sociales	Marielle Tremblay	545-5333
Sciences de l'homme		
Andragogie et éducation	Rodolphe Gagnon	545-5311
Arts	Alex Magrini	545-5751
Arts d'interprétation	Rodrigue Villeneuve	545-5713
Enseignement adaptation scolaire	Marielle Déry	545-5312
Enseignement préscolaire primaire	Louis-Philippe Boucher	545-5313
Enseignement professionnel & technologique	Marina Lessard	545-5311
Langues modernes	Antoine Raspa	545-5749
Lettres	Jacques-B. Bouchard	545-5713
Théologie	Jean-Guy Girard	545-5433
Sciences de l'activité physique	André Dorion	545-5411

L'organisation des études et les domaines d'intérêt nordiques

L'Université du Québec à Chicoutimi a pris naissance en 1969 suite à la fusion institutionnelle de l'École de génie, l'École de commerce, du Centre de formation des maîtres et du Grand Séminaire. Des lors, les études s'organisent autour de domaines d'intérêts spécifiques, à savoir:

— les sciences fondamentales et appliquées
— les sciences de la société
— les sciences de l'homme

Sa situation à la limite géographique de l'hémi-arctique ou du médio-nordique amène l'institution à privilégier dans sa programmation d'enseignement et l'organisation de la recherche deux axes d'excellence:

— les études régionales
— le Moyen Nord

Sans compter l'intérêt pour les programmes réguliers de l'UQAC, deux domaines particuliers retiennent l'attention pour un nord-canadien soit:

1 — l'école de langue française et de culture québécoise
2 — les études amérindiennes

L'école de langue française et de culture québécoise

L'école de langue française et de culture québécoise offre aux non-francophones une programmation basée sur l'immersion ayant pour objet de parfaire le français parlé et écrit et la connaissance de la culture québécoise. Cette motivation d'enseigner le français standard dans un contexte culturel québécois est rendue possible par:

— la formule d'activités d'immersion
— le caractère francophone de la population
— accueil des non-francophones
— intégration à la communauté par la formule famille d'accueil
— choix d'activités sociales, culturelles, touristiques et sportives

Bon nombre des étudiants inscrits profitent de bourses du Conseil des Ministères de l'Éducation du Canada. Les plus avancés peuvent s'inscrire à un certificat de français pour non-francophones ou au programme de perfectionnement des professeurs de français langue seconde. Dernière originalité: français et neige, un tout dernier programme alliant à la fois stage d'immersion et la pratique de sports d'hiver.

Études autochtones

La formation amérindienne correspond à un groupe d'enseignement en pleine expansion ayant pour objet de fournir une réponse adaptée aux besoins d'une identité culturelle reconnue. Les principales activités d'enseignement sont:

— le certificat en sciences de l'éducation
— le baccalauréat en enseignement élémentaire
— le certificat en linguistique amérindienne et inuit.

Les quelques 250 étudiants en formation des maîtres amérindiens se répartissent dans les centres d'enseignement hors-campus. De plus, s'ajoute une quarantaine (40) d'étudiants amérindiens inscrits aux programmes réguliers de l'institution.

Quelques détails sur les programmes dispensés ou en cours:

— *Programme de certificat de premier cycle en éducation physique pour les amérindiens, cheminement individualisé:*

- remplir des tâches d'enseignement et d'animation en milieu scolaire amérindien. Intervention en éducation physique dans les communautés indiennes du Québec.

— *Programme de certificat de premier cycle d'études individualisées en loisir pour les amérindiens:*

- assistance professionnelle et tâches de gestion et d'animation afin d'aider les membres et les groupes des communautés indiennes à s'organiser en loisir.

— *Programme de certificat de premier cycle en sciences de l'éducation, cheminement amérindien:*

- cheminement particulier aux enseignants en milieu amérindien.

— *Programme de certificat de premier cycle en technolinguistique autochone:*

— *Programme de certificat de premier cycle en travail communautaire cheminement particulier pour groupe:*

- intervention, poursuite du processus de formation continue, prise en charge des services sociaux et de santé par les communautés (Attikameks, Montagnais).

— *Programme de certificat en travail social*
(Cheminement amérindien, 1982-84, Val D'Or) (Algonquins)
(Cheminement amérindien, 1980-82, Côte-Nord) (Montagnais).

— *Programme de baccalauréat d'éducation au préscolaire et d'enseignement au primaire (cheminement amérindien):*

- enseignant généraliste apte à travailler auprès des enfants de zéro à onze ans dans les divers milieux éducatifs.

En 1985, l'Institut éducatif et culturel Attikamek-Montagnais a présenté à l'UQAC une demande de formation pour un projet de programme:

— *Programme de baccalauréat d'études individualisées en intervention communautaire: formation de ressources spécifiques:*

- répondre à la demande, faciliter un charge au niveau du marché du travail, permettre l'accès aux études de deuxième cycle.

Pour ce dernier programme, des informations complémentaires sont à venir.

Recherche nordique

Depuis une quinzaine d'années, l'Université du Québec à Chicoutimi coordonne et planifie des projets de recherche permettant de mettre en valeur les ressources naturelles et humaines du nord. Les principaux projets pivotent autour des quatre (4) thèmes majeurs, à savoir:

— les ressources minérales
— la productivité végétale en Moyen Nord
— étude des effets du climat du Moyen Nord
— communautés médio-nordiques et études amérindiennes

Centre d'études sur les ressources minérales (CERM)

Le CERM est issu directement de l'ancien Centre de recherche du Moyen Nord (CRMN) et se préoccupe principalement

de l'exploration géologique des ressources minérales

— modélisation de l'évolution magmatotectonique grenvillienne des régions du Haut Saguenay/Lac-St-Jean et Basse Côte-Nord

de la mise en valeur et exploitation des ressources minérales

— exploitation des minéraux industriels et de construction

transformation des ressources minérales

— utilisation des hautes températures et des plasmas de l'électrochimie et de l'électrométallurgie dans la métallurgie extractive pour la transformation des ressources minérales régionales du Moyen Nord.

gestion des ressources minérales

— impact environnemental de la mise en valeur des ressources minérales sur la productivité régionale et médio-nordique.

Les résultats de ces recherches s'appuient et rejoignent parallèlement les programmes offerts aux études avancées de deuxième et troisième cycle soit la maîtrise en sciences de la terre dont l'accent est mis sur la géologie du Précambrien et le nouveau doctorat en ressources minérales qui met à contribution les récents enseignements de la géo-mathématique et de l'approche systémique en géologie.

Pour réaliser ces recherches, l'UQAC dispose d'une dizaine de laboratoires bien équipés.

La productivité végétale en Moyen Nord

L'importance de la mise en valeur de la forêt boréale est sans contredit un dénominateur commun pour toutes les régions pré-nordiques pan-canadiennes. Aussi, l'UQAC devait-elle privilégier l'étude de cette ressource.

Regénération par graines des formations d'épinettes noires de la forêt domaniale de Saint-Félicien

Propriétés physico-chimiques et mise en valeur des terpènes naturels et de produits associés

— développement d'une expertise dans les méthodes d'isolation et de purification de ces produits naturels d'origine marine et forestière.

Recherche sur les bleuetières de la Sagamie

— laboratoire d'analyse de la qualité du bleuet
— aménagement de bleuetières commerciales en fonction des résultats des techniques de télédétection thermographique.

Cultures abritées

Procédés de culture en serre en milieu médio-nordique. Développement des techniques

— conservation d'énergie dans un système combiné de culture hydroponique et d'aquiculture sous serres en milieu contrôlé.

Chimie des produits naturels d'origine végétale

— mise en valeur de dérivés (arômes et huiles essentielles).

Études des effets du climat du Moyen Nord

Le Groupe de l'ingénierie de l'environnement atmosphérique oriente ses activités sur les caractéristiques mécaniques du givre et du verglas. L'attention est très marquée sur la question de la glace atmosphérique et le givrage des lignes de transport d'énergie. Les points suivants font l'objet de recherche:

— l'adhésion de la glace et sa croissance en manchon sur les conducteurs
— les effets des arcs de contournement sur les isolateurs
— l'influence du champ électrique sur la formation de la glace

La recherche se fait en laboratoire et en milieu naturel notamment avec la station de l'UQAC sur le Mont Valin et l'installation d'une ligne expérimentale par Hydro-Québec.

Les chercheurs travaillent de pair avec les étudiants du programme de maîtrise en ressources et systèmes dont la structure de cours vise à préparer des spécialistes capables d'approche systémique dans l'application du génie aux ressources.

Communautés médio-nordiques et études amérindiennes

Communautés médio-nordiques

À l'UQAC, non seulement l'axe Moyen Nord mais aussi l'axe des Études Régionales peut contribuer aux études nordiques avec des activités de recherche telles:

— études sur le pouvoir local, régional et le développement inégal
— études sur le développement des régions nordiques
— les entreprises et les coopératives régionales.

Par son complément académique, le programme de maîtrise en études régionales a pour but de promouvoir la réflexion théorique et la recherche sur les régions dans une dimension comparative inter-régionale et internationale.

Les études amérindiennes

L'existence d'une programmation détaillée en cheminement amérindien démontre la volonté majeure de l'institution à réaliser la formation des maîtres amérindiens.

Le groupe d'enseignement est complété par une groupe de recherches dont l'objet est de saisir la démarche vers l'autonomie et la prise en charge typiquement amérindienne de leur devenir.

— Les attitudes des communautés montagnaises vis-à-vis la société québécoise (rapports inter-ethniques)

  - changements psychologiques et socio-culturels
  - interface autochtone-québécois
  - perception, cognition
  - désorganisation sociale et désintégration de l'individu.

— Banque de données sur les cultures amérindiennes de la côte nord-est américaine

  - stockage de 75,000 informations
  - utilisation du logiciel SOFIDOS

— Études sur la situation passée des amérindiens perçue à travers les travaux archéologiques et ethnohistoriques

  - laboratoire archéologique
  - sites privilégiés le long des principales voies d'eau intérieures du nord québécois
  - recherche sur le terrain.

Études nordiques: support documentaire et para-académique

Bibliothèque centrale de l'UQAC

Mandat:

Soutenir l'enseignement et développer spécifiquement une collection d'excellence en fonction des deux axes de recherche.

Objectif:

Privilégier un système d'information et une politique d'accès à la documentation.

Instruments:

BADADUQ

Catalogue informatisé donnant accès aux documents acquis par la Bibliothèque de Chicoutimi (UQAC) ainsi que par l'ensemble des autres bibliothèques universitaires du réseau de l'Université du Québec.

Prêt entre bibliothèques (Interloan)

Complément du repérage de l'information, permet d'emprunter, par un service d'échanges avec les bibliothèques canadiennes et nord-américaines, les documents non disponibles sur place.

Banques de données (database) et téléréférence

Expertise de bibliothécaires disciplinaires sur les banques de données bibliographiques nord-américaines et européennes

- principaux serveurs: CAN/OLE, DIALOG, BRS, QUESTEL, QL...
- service de DSI/SDI (Selective Dissemination Information)

Publications officielles

La collection générale est désignée dépositaire universel de tous les documents publiés par le gouvernement québécois. Par exemple, la bibliothèque reçoit et rend accessible toute la documentation du secrétariat des activités gouvernementales en milieu amérindien et inuit (SAGMAI).

Dépositaire sélectif des publications du gouvernement du Canada (depuis 1975).

- Ministère des affaires indiennes et du Nord
- Geological Survey of Canada.

DOMYNO: banque de données bibliographiques rétrospective

DOMYNO: documentation sur le Moyen Nord

Recense plus de 6,600 références sur le nord du Québec. Le signalement concerne des articles de périodiques, des monographiques, des thèses, des rapports, des documents non publiés. DOMYNO est une banque informatisée facile à utiliser. L'interrogation se fait en interactif (online) par l'intermédiaire d'un terminal et l'utilisation de mots-clés (Key Words).

Collection Tekouerimat

Accès à trois siècles de contacts entre amérindiens et non-indiens. C'est le champ d'études que fait revivre la collection en présentant des textes-témoins et des travaux de recherche sur la compréhension de l'évolution démographique, sociale, économique, culturelle et linguistique des communautés amérindiennes du Québec. De plus, la langue étant le principal outil de communication et d'échange, il est de première importance de conserver, promouvoir et diffuser la langue des amérindiens du nord-est québécois.

Sport et culture

Régionalement, la vallée du Saguenay et la cuvette du Lac-St-Jean favorisent la pratique du sport de plein air, en nature et l'organisation du loisir scientifique. Les villes de la région ont su développer des infrastructures sportives et culturelles permettant la pratique de plusieurs activités physiques et artistiques.

L'Université, elle-même, par son service des activités et des aménagements sportifs (SAAS) met à la disposition des étudiants et de la population les équipements considérables qui ont servi à la tenue d'une partie des Jeux du Canada, hiver 1983.

La proximité de la nature, la taille moyenne des centres urbains et l'accueil de la population en général constituent un dosage intéressant qui se situe depuis longtemps à la base même de la renommée régionale.

Choix de cours nordique dans le régime des Études de premier cycle:

1BIO308 — Floristique du Québec — Identification des plantes vasculaires, terrestres et aquatiques du Québec avec accent sur la flore régionale.

1ETP209 — Culture en micro-climat (serres) — Connaître les divers aspects de la culture sous abri.

2ECO180 — Économie du Québec — Approfondir les concepts fondamentaux.

2ECO282 — Économie régionale — Familiarisation avec les phénomènes régionaux et leurs théories et outils soutenant les pratiques d'analyse régionale.

2ECO382 — Problèmes de développement régional — Concepts, structures et méthodes d'analyse régionale.

3DSP301 — Sentiment religieux de l'amérindien — Connaissance du sentiment et les manifestations du sentiment religieux chez l'amérindien.

3ELL190 — Didactique de la langue amérindienne I — Aperçu des problèmes linguistiques fondamentaux. Langue autochtone et principe de préservation et d'identité ethnique.

3ELL194 — Amériendien et son milieu naturel — Initiation à l'enseignement des sciences humaines, exploration du milieu naturel et de ces sujets chez l'enfant amérindien.

3ELL290 — Didactique de la langue amérindienne II — Vue d'ensemble des programmes d'écriture et de lecture amérindienne.

3ELL390 — Didactique de la langue amérindienne III — Vue d'ensemble des structures grammaticales des langues autochtones, française et anglaise.

3PED191 — Renouveau pédagogique et l'amérindien — Action pédagogique du futur enseignant en tenant compte des réalités amérindiennes.

3PED192 — Enseignement amériendien et les systèmes d'éducation — Analyse de ce qui se passe aujourd'hui dans le monde de l'éducation amérindienne au Canada et au Québec.

3PSY195 — L'Amériendien et l'apprentissage scolaire — Compréhension des facteurs qui influencent l'apprentissage scolaire du jeune amérindien.

3ANT095 — Initiation interculturelle — Développer chez l'enseignant une attitude d'ouverture, d'acceptation et de compréhension de l'amérindien.

4ANT190 — Anthropologie amérindienne I — Aider l'enseignant à redéfinir en termes anthropologiques son expérience professionnelle et la connaissance empirique de certains comportements amérindiens.

4ANT593 — Anthropologie amériendienne II — Synthèse des antécédents historiques du rôle et des effets de l'éducation aux autochtones.

4CDR168 — Entreprise de type communautaire — Articulation et synthèse des connaissances théoriques sur ce type d'entreprise et du savoir d'expérience accumulé par les participants.

4GÉO305 — Géographie du québec — Étude des grands traits du Québec. Principaux types de paysage.

4GÉO406 — Géographie du tourisme —Percevoir la nature, les causes et l'évolution du phénomène récréatif et touristique à travers le monde et le Québec y compris les régions nordiques.

4GÉO513 — Géographie des eaux — Géographie physique et étude des eaux.

4GÉO514 — Géographie des sols et de la végétation —Géographie physique et les différentes composantes de l'espace naturel.

4GÉO515 — Évolution des ressources naturelles — Compréhension de la notion de ressources naturelles et de son intégration aux études géographiques.

4GÉO800 — Problèmes de développement des espaces périphériques — Problèmes de développement économique, social et culturel de régions périphériques.

4HIS128 — Histoire amérindienne — Analyse de l'évolution des sociétés amérindiennes.

4HIS135 — Initiation à l'archéologie — Principes fondamentaux, exemples de la pratique, approche des phénomènes.

4SOC110 — Étude comparée des valeurs amérindiennes et euro-canadiennes — Comportement et système de valeurs.

5SCR102 — Religion des amérindiens — Ensemble des principaux mythes et rites de l'expression religieuse des amérindiens du Nord-Est. Réalisme et profondeur de la mythologie amérindienne.

6SCT504 — Géologie du précambrien — Connaissance du précambrien, lithologie, dépôts typiques et problèmes majeurs.

6SCT511 — Stratigraphie et géologie du continent — Lithostratigraphie et biostratigraphie appliquée à l'évolution phanérozoïque du continent.

6SCT703 — Camp de précambrien et de géologie minière — Connaissance des divers problèmes géologiques d'une région minière du Bouclier Canadien.

7FRA103 — Français pour non-francophones I — Sensibiliser au français oral et écrit à l'aide d'exercices de compréhension et de réutilisation.

7FRA203 — Français pour non-francophones II — Structure de base de la langue et échanges quotidiens.

7FRA303 — Français pour non-francophones III — Phonétique, vocabulaire, structure.

7FRA403 — Français pour non-francophones IV — Registres et niveaux de langue.

7FRA501 — Civilisation québécoise — Spécificités ethnographiques de la société québécoise.

7FRA503 — Français pour non-francophones V (oral)

7FRA504 — Français pour non-francophones V (écrit)

7FRA703 — Conversation I — Pratique intensive, utilisation maximale des connaissances.

7FRA704 — Rédaction I — Rédaction française et formes d'écriture.

7HAR202 — Histoire de l'art amérindien et inuit — Critique d'art et production amérindienne et Inuit.

7LIN155 — Sémantique amérindienne — Analyse sémantique et componentielle.

7LIN165 — Structures linguistiques amérindiennes — Se familiariser avec le domaine linguistique autochtone nord-américain.

7LIN313 — Linguistique amérindienne —Introduction aux études montagnaises, distribution géographique des familles linguistiques amérindiennes en Amérique du Nord.

Enseignement à distance: caractéristiques et fonctionnement

L'UQAC possède quatre (4) Centres Hors Campus localisés dans les principaux pôles régionaux et qui ont pour mission de prolonger l'enseignement de l'institution. Ce sont:

Alma
La Malbaie
Saint-Félicien
Sept-Iles

L'accès à la formation universitaire par les Centres Hors Campus est certes une formule adaptée aux régions périphériques. C'est sûrement le Centre Hors Campus de Sept-Iles qui est le plus concerné par l'enseignement nordique. Le Centre regroupe six (6) sous-centres jouant leur rôle de point d'ancrage:

Fermont
Havre-Saint-Pierre
Port-Cartier
Hauterive
et jusqu'à récemment
Schefferville
Gagnon

Dans chaque sous-centre, un responsable prend en charge l'organisation matérielle des cours, la documentation, le dépôt de manuels. Il joue le rôle d'agent de liaison entre les étudiants, le professeur ou le chargé de cours et l'UQAC.

La variété des programmes dispensés à ce jour a été les certificats en administration, nursing communautaire, sciences de l'éducation, sciences religieuses, en animation et des cours en informatique. Le Baccalauréat d'enseignement préscolaire et primaire a été offert et l'on pourrait ajouter toute la programmation se rapportant au cheminement amérindien.

Transférabilité des crédits de cours

Attentif à l'intérêt actuel des étudiants, à toute la question des crédits transférables, l'UQAC s'assure d'accorder une attention particulière à toute demande étudiante qui sera analysée à son juste mérite.

Toute demande devra être conforme à la procédure et lignes de conduite en la matière. Les cours peuvent être reconnus comme *équivalents* si ces derniers respectent les principes de l'Université du Québec. Une expérience professionnelle peut être reconnue à un cours si elle remplit les conditions de façon évidente et probante.

La formation personnelle (autodidacte) peut être également estimée à sa valeur.

Enfin, l'étudiant éligible peut se voir accorder la reconnaissance de cours sinon avoir recours aux modalités d'appel.

Conférences d'importance avec participation de l'UQAC

20 au 24 mars 1985 — Chicoutimi
53^e Congrès ACFAS. Université du Québec à Chicoutimi.
Association Canadienne Française pour l'avancement des sciences.
Présentation de 1,100 communications
52 champs d'intérêts scientifiques (sections)
4 colloques internes au Congrès
1 conférence internationale
Plusieurs expositions

Septembre 1984 — Chibougamau
Symposium Chibougamau — CIM 1984
Institut Canadien des Mines
Sujets abordés: stratigraphie et minéralisation du secteur de Chibougamau
38 conférences avec publication
14 par les membres des équipes de recherche du CERM (UQAC)

Mars 1984 — Sept-Iles
Colloque sur l'Economie et Développement Nordique en collaboration avec le Conseil Régional de Développement et le Cegep de Sept-Iles.
Sujet: les orientations du développement des régions nordiques du Québec

Juin 1980 — Edmonton, Whitehorse
Colloque (8e) sur les Bibliothèques Nordiques
Participation de l'UQAC (CRMN) comme responsable d'une collection nordique
Membre de INQ, Information Nord Québec

Principaux chercheurs par sujet de spécialisation

Sciences de la terre et du milieu ambiant (Earth and Environmental Sciences)

ARCHAMBEAULT, Guy	(génie minier) (mécanique des roches)
CARIGNAN, Jacques	(géochimie)
CHOWN, Edward	(pétrologie)
DUBERGER, Reynald	(séismologie)
GUHA, Jayanta	(gitologie) (géochimie)
ROY, Denis W.	(géologie structurale)
WOUSSEN, Gérard	(pétrologie)

Ingénierie (Engineering)

DRUEZ, Jacques	(génie mécanique)
LAFORTE, Jean-Louis	(génie métallurgique)
MCCOMBER, Pierre	(génie mécanique)
NGUYEN, Van-Thahn-Van	(génie civil, hydrologie)
VONARBURG, Jean-Noël	(électronique, cultures abritées)

Sciences biologiques (Biological Sciences)

COLLIN, Guy	(photochimie des composés organiques gazeux)
COTE, Raynald	(écologie marine)
GAGNON, Michel	(chimie) (productivité aquatique)
GARNEAU, François-Xavier	(chimie)
LALANCETTE, Louis-Marie	(ichtyologie)
LARRIVEE, Denis	(zoologie) (faune marine)
LECLERC, André	(physique, métaux en suspension)

Humanités (Humanities)

BAUDOUX, Claudine	(évaluation et méta-évaluation de programme)
BOURBEAU, André-François	(plein-air, loisir nature)
MCLEAN, Erick	(activité physique spécifique aux Amérindiens)
MOREAU, Jean-François	(anthropologie, archéologie)
KURTNESS, Jacques	(psychologie, anthropologie culturelle)
SAINT-ONGE, Jacques	(affaires sociales, groupes communautaires
VINCENT, Jean-Paul	(histoire de l'art, art amérindien)

Géographie — Histoire (Geography — History)

BOUCHARD, Gérard	(histoire sociale)
COTE, André	(histoire)
DESY, Jean	(géographie du tourisme)
DUFOUR, Jules	(géographie physique régionale-environnement)
GAUTHIER, Majella	(environnement, cartographie, géographie nordique)
KLEIN, Juan Luis	(géographie économique et régionale)
LEMIEUX, Gilles	(télédétection et ressources naturelles)
PENA, Orlando	(climatologie)

Économie et administration (Economics and Administration)

COULOMBE, Claude	(administration, gestion des petites et moyennes organisations)
MOUSSALY, Sergief	(sciences économiques, développement nordique)
PREVOST, Paul	(système)

Note bibliographique

Nous attirons l'attention du lecteur à l'effet qu'une bonne part des éléments communiqués dans ce dossier de présentation ont été puisés directement dans les documents originaux existants. Plusieurs thèmes ont été tirés de ses sources et à quelques reprises les extraits de textes initiaux ont été recopiés.

Les principales sources ou services consultés ont été:

a) Documentation de l'Ecole de langue française et de culture québécoise.

b) Documentation et plan d'orientation et développement des Groupes des Études Amérindiennes.

c) Rapports annuels du Centre de recherche du Moyen Nord (CRMN).

d) Rapport annuel 1984-85 du Centre d'études sur les Ressources Minérales, CERM. Octobre 1985)

e) Association Canadienne-Française pour l'avancement des sciences. Annales de l'ACFAS volume 52-53 1985. Résumé des communications.

f) Rapport annuel 1984 de la Fondation de l'UQAC, la Fondation Sagamie et l'Institut Scientifique.

g) Les études avancées et la recherche, Un Pays de Connaissances, Publication de l'Université du Québec à Chicoutimi, mars 1985.

h) Documentation du Décanat des études de Premier Cycle — UQAC (différents dossiers de programmes).

Remerciements aux personnes ressources et agents de liaison qui ont collaboré à cette présentation.

UNIVERSITÉ DU QUÉBEC À CHICOUTIMI CHICOUTIMI, QUÉBEC

General information

Université du Québec à Chicoutimi
555, boulevard de l'Université
Chicoutimi, (Québec)
G7H 2B1

Telephone: 418-545-5011

Telex: 051-36108

Students registered in 1985

	Students		
Level	Full-time	Part-time	Total
Under-Graduate	2425	4220	6645
Post-grad., (Master's program)	123	225	348
Post-grad., (Doctoral program)	12		12
Total	2560	4445	7005

List of modules, directors of modules, telephone numbers of module secretariats

Please Note: These courses are given only in French

Module	*Director*	*Telephone (Secretariat)*
Pure and applied sciences		
Biology	Christian Cholette	545-5415
Chemistry	Jean-Marie Hachey	545-5415
Engineering, General	René Brunelle	545-5204
Mathematics & Computer Science	Gilles Gauthier	545-5487
Physics	Michel Suquet	545-5487
Health Sciences	Hélène Roy	545-5315
Earth Sciences	Reynald Duberger	545-5202
Social Science		
Administration	Ghislain Tremblay	545-5236
Social Affairs*	Jean-Pierre Deslauriers	545-5272
Geography	Majella-J. Gauthier	545-5330
History	André Côté	545-5331
Social Sciences**	Marielle Tremblay	545-5333
Human sciences		
School Education		
Education of Adults	Rodolphe Gagnon	545-5311
Art	Alex Magrini	545-5751
Performing Arts	Rodrigue Villeneuve	545-5713
Special Education	Marielle Déry	545-5312
Pre-School & Primary Education	Louis-Philippe Boucher	545-5313
Vocational & Technical Education	Marina Lessard	545-5311
Modern Languages	Antoine Raspa	545-5749
Literature	Jacques-B. Bouchard	545-5713
Theology	Jean-Guy Girard	545-5433
Physical Education & Physical Activity	André Dorion	545-5411

* Social work, gerontology, community leadership, worker safety, social rehabilitation

**Economics, accounting, psychology, sociology, anthropology

Organization of northern studies and fields of interest

The University of Québec at Chicoutimi was formed in 1969 by an institutional merger of the School of Engineering, the School of Commerce, the Teachers' Training Centre and the Grand Séminaire. Courses were immediately organized around specific fields of interest, viz.:

- pure and applied sciences
- social sciences
- human sciences

Because of its situation at the geographical limit of the Sub-Arctic or Mid-North the University has organized its teaching and research programs with special emphasis on two areas of excellence:

- regional studies
- the Mid-North

Besides the regular programs offered by UQAC there are two areas which are of particular interest to northern Canadians, namely:

1. the Centre for French language learning and Québec culture
2. Amerindian studies

The Centre for French language learning and Québec culture

The Centre for French language learning and Québec culture offers non-Francophones an immersion program to enable them to master spoken and written French and to acquire a knowledge of Québec culture. The goal of teaching standard French in a Québec cultural context is achieved through:

- the immersion activity method
- the Francophone character of the population
- hosting non-Francophones
- integration into the community through the family hosting method
- choice of social, cultural, tourist and sports activities

Many of the students who register obtain scholarships from the Canadian Council of Ministers of Education. The most advanced may register for studies leading to a certificate in French for non-Francophones or for a proficiency program for teachers of French as a second language. The latest innovation: French in the Snow (*Français et neige*) an up-to-the-minute program combining a period of immersion with winter sports.

Native Studies

The Amerindian program covers a rapidly developing group of courses intended to provide an appropriate response to the needs of a recognized cultural identity. The main course programs lead to:

- the certificate in education
- the B.A. in elementary education
- the certificate in Amerindian and Inuit linguistics.

There are about 250 students in Amerindian teacher training, dispersed in off-campus teaching centres. There are also about 40 Amerindian students registered in the University's regular programs.

Some details on programs and courses offered:

- *Undergraduate program leading to certificate in physical education for Amerindians, individualized course pattern:*
  - performance of instructional and leadership assignments in an Amerindian school environment. Physical education activity in the Indian communities of Québec.
- *Undergraduate program leading to certificate in individualized leisure studies for Amerindians:*
  - professional aid and assignments in management and community leadership, intended to help individuals and groups in Indian communities organize their leisure.
- *Undergraduate program leading to certificate in education, Amerindian course pattern*
  - special course pattern for teachers in an Amerindian environment.
- *Undergraduate program leading to certificate in linguistic techniques applied to native languages*
- *Undergraduate program leading to certificate in community work, special course pattern for groups:*
  - social action, continuation of further education and training, management of social and health services by the communities (Attikameks, Montagnais).
- *Program leading to certificate in social work (Amerindian course pattern, 1982-84, Val d'Or — Algonquins) (Amerindian course pattern, 1980-82, Côte-Nord — Montagnais)*
- *Program leading to B.A. in pre-schol and primary education (Amerindian course pattern):*
  - generalist teacher, able to work with children up to eleven in a variety of educational environments.

In 1985 the Attikamek-Montagnais Educational and Cultural Institute presented a request to UQAC for training for a projected program:

- *Program leading to B.A. in individualized studies in community action — training of specific resource persons:*
  - responding to the request, assistance in finding a foothold in the labour market, provision of access to studies leading to a master's degree.

Further information will be provided on this program.

Northern research

For fifteen years the University of Québec at Chicoutimi has been co-ordinating and planning research projects aimed at developing the natural and human resources of the North. The principal projects are related to four major themes, viz.:

- mineral resources
- plant productivity in the Mid-North
- study of the effects of the climate of the Mid-North
- Mid-North communities and Amerindian studies

Centre for Mineral Resource Studies (CERM)

CERM is the direct successor of the former Mid-North Research Centre and is mainly concerned with

the geological exploration of mineral resources

- modelling the Grenvillian magmatectonic evolution of the Upper Saguenay/Lake St. John regions and the Lower North Shore

the develepment and extraction of mineral resources

- extraction of minerals for use in industry and construction

processing of mineral resources

- application of high temperatures and electrochemical and electromagnetic plasmas in extractive metallurgy to the processing of the regional mineral resources of the Mid-North

mineral resources management

- environmental impact of the development of mineral resources on aquatic productivity in the region and the Mid-North.

The results of this research are based upon and closely linked with the programs of post-graduate work leading to the master's and doctor's degrees, namely, the master's degree in earth sciences, which is focussed on the geology of the Pre-Cambrian, and the new doctorate in mineral resources which draws upon recent advances in geomathematics and the systems approach to geology.

UQAC has ten well equipped laboratories for the purposes of this research.

Plant Productivity in the Mid-North

The importance of developing the Boreal forest is unquestionably a common denominator for all the regions of Canada which adjoin the North. It was therefore to be expected that UQAC would emphasize the study of this resource.

Regeneration by seeding of the black spruce stands in the Saint-Félicien Crown forest.

Physico-chemical properties and development of natural terpenes and associated products

- development of expertise in methods of isolating and purifying these natural marine and forest products

Research on blueberries in the Saguenay-Lake St. John region

- laboratory analysis of the quality of blueberries
- development of blueberry patches for commerical marketing on the basis of thermographic remote sensing

Greenhouse cultivation

Procedures for cultivation under glass in the Mid-North environment. Development techniques

- energy conservation in a system of combined hydroponics and aquaculture under glass in a controlled environment.

Chemistry of natural products derived from vegetation

- development of derivatives (flavourings and essential oils).

Studies on the Effects of the Mid-North Climate

The Atmospheric Environment Engineering Group focuses its activities on the mechanical characteristics of frost and freezing rain. Particular attention is paid to the problem of atmospheric ice and the frosting over of power transmission lines. The following topics are under investigation:

- adhesion of ice and ice accretion on conductors
- effects of flash-overs on insulators
- influence of the electric field on ice formation

Research is carried on in the laboratory and in the field, notably in connection with the UQAC station on Mont Valin and the installation of an experimental line by Hydro-Québec.

The researchers work together with the students enrolled in the master's program in resources and systems, whichis structured with a view to training specialists who will be able to use a systemic approach in applying engineering to resources.

Mid-North Communities and Amerindian Studies

Mid-North Communities

At UQAC both the Mid-North and the Regional Studies research concentrations can contribute to Northern Studies with such research activities as:

- studies of local and regional political power and unequal development
- studies of the development of northern regions
- regional enterprises and co-operatives.

The master's program in regional studies is intended, through its academic content, to promote reflection on questions of theory and to encourage regional research with a comparative inter-regional and international dimension.

Amerindian studies

The existence of a detailed program following an Amerindian course-pattern demonstrates the fundamental concern of the University with the training of Amerindian teachers.

The teaching group is complemented by a research group whose objective is to comprehend the process of development towards autonomy and the characteristic ways in which Amerindians assume responsibility for their own future.

- The attitudes of Montagnais communities to Québec society (inter-ethnic relations)
  - psychological and socio-cultural changes
  - interface between native peoples and Québec
  - perception, cognition
  - social disorganization and individual disintegration.
- Data bank on the Amerindian cultures of the North-East Coast of the Americas
  - storage for 75,000 items
  - employment of SOFIDOS software
- Studies of the past situation of the Amerindians as perceived through archaeology and ethno-history
  - archaeological laboratory
  - sites of special significance on the main inland waterways of northern Québec
  - fieldwork.

Northern Studies: specialized library resources within and outside the University

Central Library of UQAC

Task:

To support teaching and specifically to develop a high quality collection to meet the needs of the two research concentrations.

Objective:

To give priority to the development of an information system and a policy of access to library resources.

Instruments:

BADADUQ

Computerized catalogue giving access to documents acquired by the library at Chicoutimi (UQAC) and by the other university libraries in the University of Québec network.

Interloan

Complements the process of information retrieval by making it possible to borrow documents not in the library through an exchange service linking libraries in Canada and U.S.A.

Database and information retrieval

Expert knowledge of specialized librarians regarding North American and European data banks

- principal vendors: CAN/OLE, DIALOG, BRS, QUESTEL, QL ......
- SDI (Selective Dissemination Information)

Official publications

The general collection is the designated universal depository for all documents published by the Government of Québec. For example, the library receives and makes accessible all the documentation of the Secretariat for Government Activities in the Amerindian and Inuit Communities (SAGMAI).

Selective depository for publications of the Government of Canada (since 1975).

- Department of Indian Affairs and Northern Development
- Geological Survey of Canada

DOMYNO: Data Bank for Retrospective Bibliography

DOMYNO: documentation on the Mid-North

Lists more than 6,600 references on northern Québec. Reporting covers journal articles, monographs, theses, reports and unpublished documents. DOMYNO is easy to access. Enquiries are made on-line through the use of a terminal and keywords.

Tekouerimat Collection

Provides access to three centuries of contact between Amerindians and non-Indians. The collection is the subject of new interest because of activity in this area; it offers illustrative texts and research studies to assist understanding of the demographic, social, economic, cultural and linguistic evolution of the Amerindian communities of Québec. Moreover, as language is the principal instrument of communication and exchange it is fundamentally important to preserve the language of the

Amerindians of north-eastern Québec, and to encourage its widespread use.

Sport and Culture

As a region, the Saguenay valley and the Lake St. John basin are well suited to outdoor sports, including both informal open air activities and systematically organized recreation. The cities and towns in the region have developed the necessary sports and cultural infrastructure for a number of physical and artistic activities.

The University itself, through its Sports Activities and Facilities Service (SAAS), provides the students and the local population with a substantial amount of equipment, which was used during the Canada Winter Games of 1983.

The region has a long-standing reputation, due to the attractive way in which it combines easy access to nature, the relatively small size of its cities and towns, and the hospitable character of its people.

Choice of courses with a northern focus at the undergraduate level:

Please note that these courses are given only in French

1BIO308 — Floristique du Québec — Identification of the vascular terrestrial and aquatic plants of Québec with emphasis on the regional flora.

1ETP209 — Culture en micro-climat (serres) — Introduction to the diverse aspects of cultivation under glass.

2ECO180 — Économie du Québec — Study of fundamental concepts.

2ECO282 — Économie régionale — Familiarization with regional phenomena, the theories concerning them and the instruments used for the purposes of regional analysis.

2ECO382 — Problèmes de développement régional — Concepts, structures and regional methods of analysis.

3DSP301 — Sentiment religieux de l'amérindien — Study of the religious attitudes of the Amerindian and the ways in which they find expression.

3ELL190 — Didactique de la langue amérindienne I — Overview of the basic linguistic problems. Native tongue and the principle of preservation and ethnic identity.

3ELL194 — Amérindien et son milieu naturel — Introduction to the teaching of the human sciences, exploration of the natural environment and of the Indian child's approach to these subjects.

3ELL290 — Didactique de la langue amérindienne II — Survey of the programs of writing and reading for Amerindians.

3ELL390 — Didactique de la langue amérindienne III — Survey of the grammatical structures of the native languages and of French and English.

3PED191 — Renouveau pédagogique et l'amérindien — Pedagogical activity of the future teacher, based on the realities of Amerindian life.

3PED192 — Enseignement amérindien et les systèmes d'éducation — Analysis of current developments in Amerindian education in Canada and Québec.

3PSY195 — L'amérindien et l'apprentissage scolaire — Understanding the factors which affect the schooling of the young Amerindian.

3ANT095 — Initiation interculturelle — Developing, in the teacher, an attitude of openness, acceptance and understanding towards the Amerindian.

4ANT190 — Anthropologie amérindienne I — Assisting teachers to redefine, in anthropological terms, their professional activity and their empirical knowledge of certain aspects of Amerindian behaviour.

4ANT593 — Anthropologie amérindienne II — Synthesis of the historical background of the role and effects of education among the Indians.

4CDR168 — Entreprise de type communautaire — Articulation and synthesis of the body of theoretical knowledge relating to this type of business and of the practical knowledge accumulated by those who have participated in it.

4GEO305 — Géographie du Québec — Study of the main features of Québec. Principal types of landscape.

4GÉO406 — Géographie du tourisme — Observing the nature, causes and evolution of the phenomenon of recreation and tourism in the world as a whole and in Québec and the northern regions.

4GÉO513 — Géographie des eaux — Physical geography and the study of water.

4GÉO514 — Géographie des sols et de la végétation — Physical geography and the various components of natural space.

4GÉO515 — Évolution des ressources naturelles — Understanding the notion of natural resources and its integration into geographical studies.

4GÉO800 — Problèmes de développement des espaces périphériques — Problems of economic, social and cultural development in outlying areas.

4HIS128 — Histoire amérindienne — Analysis of the evolution of Amerindian societies.

4HIS135 — Initiation à l'archéologie — Basic principles, practical examples, approach to phenomena.

4SOC110 — Étude comparée des valeurs amérindiennes et euro-canadiennes — Behaviour and value systems.

5SCR102 — Religion des amérindiens — Review of the principal myths and rites expressing the religion of the north-eastern Amerindians. Realism and depth of Amerindian mythology.

6SCT504 — Géologie du précambrien — Initiation into the Pre-Cambrian, lithology, typical deposits and major problems.

6SCT511 — Stratigraphie et géologie du continent — Lithostratigraphy and biostratigraphy applied to the phanerozoic evolution of the continent.

6SCT703 — Camp de précambrien et de géologie minière — Initiation into the various geological problems of a Canadian Shield mining region.

7FRA103 — Français pour non-francophones I — Tuning in to spoken and written French through comprehension exercises and guided exercises in language use.

7FRA203 — Français pour non-francophones II — Basic structure of the language and everyday conversation.

7FRA303 — Français pour non-francophones III — Phonetics, vocabulary, structure.

7FRA403 — Français pour non-francophones IV — Registers and levels of language.

7FRA501 — Québec civilization — Specific ethnographic characteristics of Québec society.

7FRA503 — Français pour non-francophones V (oral)

7FRA504 — Français pour non-francophones V (écrit)

7FRA703 — Conversation I — Intensive practice with maximum use of knowledge.

7FRA704 — Rédaction I — French composition, and forms of writing.

7HAR202 — Histoire de l'art amérindien et Inuit — Art criticism and Amerindian and Inuit production.

7LIN155 — Sémantique amérindienne — Semantic and componential analysis.

7LIN165 — Structures linguistiques amérindiennes — Familiarization with the area of North American native linguistics.

7LIN313 — Linguistique amérindienne — Introduction to Montagnais studies, geographical distribution of the Amerindian linguistic families in North America.

Distance Education: characteristics and procedures

UQAC operates four (4) Off-Campus Centres at the principal focal points of the region for the purpose of providing extra-mural education. The locations are:

Alma
La Malbaie
Saint-Félicien
Sept-Îles

Access to university instruction through the Off-Campus Centres has shown itself to be a method well adapted to the needs of the outlying areas. The Centre most concerned with Northern Studies is certainly the one located at Sept-Îles. This Centre links together six (6) sub-centres, each of which serves as a base for its area:

Fermont
Havre-Saint-Pierre
Port-Cartier
Hauterive

Until recently there were sub-centres at

Schefferville
Gagnon

In each sub-centre there is a person responsible for the physical organization of the courses, the documentation and the supply of textbooks. This person provides the liaison between the students, the professor or lecturer, and UQAC.

The programs available to date are: certificates in administration, community nursing, education, religious studies, community leadership and information science. The bachelor's degree in pre-school and primary education has been offered, and mention may also be made of the entire set of programs based on the Amerindian course pattern.

Transferability of course credits

UQAC has kept in mind the current concerns of the students and the whole question of transferable credits; it makes a point of giving particular attention to any student request and examining it on its merits.

Any request submitted must conform to the relevant procedure and policy. Courses may be recognized as *equivalent* if they are in accordance with the principles of the University of Québec. Professional experience may be recognized as equivalent to a course if it clearly satisfies the conditions.

Self-tuition may also be evaluated on its merits.

Finally, eligible students may obtain recognition of their courses, or else use the appeal procedure.

Leading Conferences in which UQAC has participated

March 20-24, 1985 — Chicoutimi
53rd Congress of the French-Canadian Association for the Advancement of Science (ACFAS), University of Québec at Chicoutimi.
Papers read: 1,100
Fields of scientific interest (sections): 52
4 symposia organized as part of the Congress program
1 international lecture
Several exhibitions

September 1984 — Chibougamau
Chibougamau Symposium — CIM 1984
Canadian Mining Institute
Topics discussed: stratigraphy and mineralization of the Chibougamau sector
38 published papers, 14 of them by members of the CERM research teams at UQAC

March 1984 — Sept-Îles
Symposium on the Northern Economy and its Development, in co-operation with the Regional Development Council and the Sept-Îles General and Vocational College (CEGEP).
Theme: development trends in the northern regions of Québec

June 1980 — Edmonton, Whitehorse
Eighth Northern Libraries Colloquy
UQAM (CRMN) participated as an institution with northern holdings
Member of Information Northern Québec (INQ)

Principal researchers by subject specialization

Earth and Environmental Sciences

ARCHAMBEAULT, Guy	(mining engineering; rock mechanics)
CARIGNAN, Jacques	(geochemistry)
CHOWN, Edward	(petrology)
DU BERGER, Reynald	(seismology)
GUHA, Jayanta	(metallogeny; geochemistry)
ROY, Denis W.	(structural geology)
WOUSSEN, Gérard	(petrology)

Engineering

DRUEZ, Jacques	(mechanical engineering)
LAFORTE, Jean-Louis	(metallurgical engineering)
McCOMBER, Pierre	(mechanical engineering)
NGUYEN, Van-Thanh-Van	(civil engineering, hydrology)
VONARBURG, Jean-Noël	(electronics, cultivation under glass)

Biological Sciences

COLLIN, Guy	(photochemistry of gaseous organic compounds)
CÔTÉ, Raynald	(marine ecology)
GAGNON, Michel	(chemistry)
GARNEAU, François-Xavier	(chemistry)
LALANCETTE, Louis-Marie	(ichthyology)
LARRIVÉE, Denis	(zoology; marine fauna)
LECLERC, André	(physics; metals in suspension)

Humanities

BAUDOUX, Claudine	(program evaluation and meta-evaluatio)
BOURBEAU, André-François	(outdoor activity, informal recreation)
McLEAN, Erick	(physical activity specific to the Amerindians)
MOREAU, Jean-François	(anthropology; archaeology)
KURTNESS, Jacques	(psychology; cultural anthropology)
SAINT-ONGE, Jacques	(social issues; community groups)
VINCENT, Jean-Paul	(art history; Amerindian art)

Geography-History

BOUCHARD, Gérard	(social history)
CÔTÉ, André	(history)
DÉSY, Jean	(geography of tourism)
DUFOUR, Jules	(regional physical geography environment)
GAUTHIER, Majella	(environment, cartography, geography of the North)
KLEIN, Juan Luis	(economic and regional geography)
LEMIEUX, Gilles	(remote sensing and natural resources)
PENA, Orlando	(climatology)

Economics and Administration

COULOMBE, Claude	(administration, management of small and medium-sized businesses)
MOUSSALY, Sergiet	(economics, northern development)
PRÉVOST, Paul	(systems)

Bibliographical note

The reader's attention is drawn to the fact that a large part of the information provided in this descriptive summary has been taken directly from existing original documents. A number of topics have been taken from these sources and in several cases extracts from the original texts have been copied.

The principal sources and departments consulted were:

a) Documents of the École de langue française et de culture québécoise (Centre for French language learning and Québec culture).

b) Documents and development plan of the Groupes des Études Amérindiennes (Amerindian Studies groups).

c) Annual reports of the Centre de Recherche du Moyen Nord (CRMN Mid-north Research Centre).

d) Annual report, 1984-85, of the Centre d'études sur les Ressources Minérales, (CERM Centre for Mineral Resource Studies), October 1985.

e) Association Canadienne-Française pour l'avancement des sciences (French-Canadian Association for the Advancement of Science). Annales de l'ACFAS, volume 52-53, 1985. Summaries of papers.

f) Annual report for 1984 of the Fondation de l'UQAC, la Fondation Sagamie and the Institut Scientifique (the UQAC Foundation, the Saguenay-Lake St. John Foundation and the Science Institute).

g) Graduate studies and research, Un Pays de Connaissances (A Land of Knowledge), published by the University of Québec at Chicoutimi, March 1985.

h) Documents in the Décanat des études de Premier Cycle (office of the Dean of Undergraduate Studies) at UQAC (various program files).

We wish to express our thanks to the resource persons and liaison officers who assisted us with the preparation of this summary.

UNIVERSITÉ DU QUÉBEC À TROIS-RIVIÈRES TROIS-RIVIÈRES, QUÉBEC

Renseignements généraux

Université du Québec à Trois-Rivières, C.P. 500, Trois-Rivières (Québec) G9A 5H7. Principales facultés et écoles spécialisées: Les principales disciplines sont représentées à l'exception de droit et médecine.

Organisation des études nordiques

Un comité de formation nordique s'occupe des divers aspects touchant à la recherche dans le Nord (responsable: B. Vermot-Desroches, 819-376-5736). En revanche, aucun cours à spécificité nordique n'est dispensé à l'U.Q.T.R.

Caractéristiques générales de l'enseignement à distance

L'U.Q.T.R. fait partie du réseau de Télé-enseignement de l'Université du Québec. Ce service de Télé-université est géré par le siège social de l'U.Q. à Québec.

Transférabilité des crédits de cours

L'U.Q.T.R. avec ses directeurs de programmes pratique couramment le transfert de crédits de cours en conformité avec ses politiques et les règlements en vigueur.

La recherche nordique

La recherche nordique à l'U.Q.T.R. concerne les sciences humaines et les sciences exactes. L'ensemble des projets concerne la partie orientale du Nord canadien (province de Québec et région de l'Ile de Baffin). Il s'agit le plus souvent de projets concernant l'évaluation de potentiels socio-économiques, d'impacts économiques ou encore l'étude de l'environnement nordique (insectes piqueurs, résistance au froid, météorologie, etc.). De nombreux étudiants (non-autochtones) ont participé et participent à des projets subventionnés par les grands conseils de recherche (fédéraux, et nationaux), par des commandites privées et par le Programme de formation scientifique dans le Nord du M.A.I.N. Une conférence d'envergure nationale a été organisée en 1983 sur le thème l'Interface Blancs-amérindiens (B. Vermot-Desroches, responsable).

Les spécialistes du Nord

J.P. Bourassa: Département de chimie, biologie, entomologie, Nord Québécois.

A. Maire: Département de chimie, biologie, entomologie, Nord Québécois.

J. Litinsky: Département des Sciences Humaines, géographe, météorologue, Arctique extrême-Nord.

A. Quirion: Département des Sciences de l'activité physique, Baie de James.

B. Vermot-Desroches: Département d'administration et d'économique, économiste, région de Baffin.

Références bibliographiques

1) Vers de nouveaux horizons, Plan triennal 1985-1988.
2) Rapport annuel, Université du Québec, 1984-1985.

UNIVERSITÉ DU QUÉBEC
À TROIS-RIVIÈRES
TROIS-RIVIÈRES, QUÉBEC

General information

Université du Québec à Trois-Rivières, C.P. 500, Trois-Rivières, Québec G9A 5H7.

Note: The language of instruction and publication at the University is French.

Principal faculties and centres of specialization: The main disciplines are represented, with the exception of law and medicine.

Organization of northern studies

A committee on northern training is responsible for the various aspects of research in the North (contact: B. Vermot-Desroches, 819-376-5736). There are, however, no courses given at the U.Q.T.R. which deal specifically with the North.

General features of Distance Education

The U.Q.T.R. is part of the University of Québec's Distance Education Network. This Distance University (Télé-université) is administered from the U.Q. head office in Québec City.

Transferability of course credits

The U.Q.T.R. and its directors of programs currently allow course credit transfer in accordance with the University's policies and existing regulations.

Northern research

Northern research at the U.Q.T.R. is carried out in the areas of the humanities and social sciences (sciences humaines) and the hard sciences (sciences exactes). The projects are all located in the eastern part of the Canadian North (Province of Québec and the Baffin Island region). The majority are focussed on the assessment of socio-economic potential, economic impact or northern environmental studies (biting insects, cold-resistance, meteorology, etc.). Many students (non-natives) have been, and are being, involved in projects supported by the major research councils (federal and national), by private sponsors and by the Northern Scientific Training Program of D.I.A.N.D. A national conference was organized in 1983 on the topic of the White-Amerindian Interface (organizer: B. Vermot-Desroches).

Northern specialists

J.P. Bourassa, Department of chemistry, biology, entomology, Northern Québec.

A. Maire, Department of chemistry, biology, entomology, Northern Québec.

J. Litinsky, Department of human sciences, geography, meteorology, High Arctic.

A. Quirion, Department of physical education, James Bay.

B. Vermot-Desroches, Department of management studies and economics, economist, Baffin region.

Bibliographic references

1) Towards new horizons (Vers de nouveaux horizons) Three Year Plan, 1985-1988
2) Annual Report, University of Québec, 1984-1985

UNIVERSITÉ DU QUÉBEC EN ABITIBI-TÉMISCAMINGUE
ROUYN, QUÉBEC

Reseignements généraux

Université du Québec en Abitibi-Témiscamingue
42, rue Mgr Rhéaume est
Rouyn, Qc
J9X 5E4
Tél.: (819) 762-0971

Nombre d'étudiants de premier cycle à plein temps: 548
Nombre d'étudiants de premier cycle à temps partiel: 1711
Nombre d'étudiants de deuxième cycle à temps partiel: 80

Principales facultés (modules):

- Sciences de l'administration
- Sciences comptables
- Sciences appliquées
- Sciences sociales
- Sciences de la santé
- Sciences de l'éducation
- Sciences du comportement humain

Organisation des études nordiques:

L'Université du Québec en Abitibi-Témiscamingue a obtenu ses lettres patentes en octobre 1983. Dans son premier plan de développement, l'UQAT énonçait sa mission de promouvoir la recherche liée à la nordicité et à la mise en valeur des ressources de la terre.

À partir des ressources professorales dont elle dispose et qui démontrent un intérêt pour les interventions en milieu nordique, l'UQAT poursuit trois projets:

- Formation des maîtres Inuit: Il s'agit d'un projet à Povungnituk et à Ivujivik dont le responsable est M. Charles Bergeron, directeur du département d'éducation.
- L'UQAT poursuit également un projet de perfectionnement des maîtres en français, langue d'usage, auprès des communautés Amérindiennes. Un projet est en cours auprès des Algonquins du Lac Simon et un autre projet est en voie d'élaboration avec la Commission scolaire Crie. M. Charles Bergeron est également responsable de ce projet.
- L'UQAT a également entrepris un projet de recherche-développement, relatif à la prise en charge par une commission scolaire autochtone, des affaires éducatives du Conseil de bande Algonquin au Lac Simon. Le responsable est M. Jean-Pierre Marquis, professeur au département des sciences sociales et de la santé.

L'UQAT possède depuis un an, le Centre de documentation nordique qui lui a été légué par la Société de développement de la Baie James. Il s'agit d'une collection qui renferme plus de 10 000 documents, d'une cartothèque, d'une collection de photographies aériennes et de photographies prises par satellite du territoire de la Baie James, d'une collection de diapositives et d'une banque de données informatisées sur l'environnement, couvrant l'ensemble du territoire ayant fait l'objet des travaux d'aménagement du complexe La Grande.

Par ailleurs, la Société d'énergie de la Baie James a cédé à l'UQAT, au cours de la dernière année, ses équipements de laboratoire installés à LG-2 — Radisson. Ces équipements devraient permettre à l'Université de compter sur un laboratoire bien équipé dans le domaine des études environnementales.

Choix de cours nordiques:

La banque de cours de l'Université du Québec en Abitibi-Témiscamingue ne possède pas de cours nordiques spécifiques. À l'intérieur des différentes interventions, les professeurs sont invités à adapter les contenus et les méthodes pédagogiques aux besoins et aux conditions culturelles des clientèles autochtones.

Enseignement dans le nord canadien:

L'Université répond aux demandes spécifiques qui lui sont adressées par les communautés autochtones. Les enseignements sont offerts dans les villages où réside la clientèle étudiante.

Transférabilité des crédits:

L'UQAT n'a pas, pour l'instant, de politique relative à la transférabilité des crédits entre les collèges techniques et l'instruction universitaire.

La recherche nordique:

Compte tenu de la jeunesse de l'Université et de la mise en place récente des interventions dans le Nord, le volet "recherche" demeure encore à développer.

Professeurs particulièrement intéressés au développement nordique:

M. Charles Bergeron, Mme Gisèle Maheux, M. Jean-Pierre Marquis: développement des services éducatifs en milieu nordique faiblement peuplé.

M. Enrique Colombino, M. Jean-Pierre Marquis, Mme Micheline Potvin: le développement régional dans des conditions nordiques.

Études autochtones:

Compte tenu des ressources professorales disponibles, les principales préoccupations de l'Université sont orientées vers les sciences de l'éducation et les sciences sociales.

UNIVERSITÉ DU QUÉBEC EN ABITIBI-TÉMISCAMINGUE ROUYN, QUÉBEC

General Information

Université du Québec en Abitibi-Témiscamingue
42, rue Mgr Rhéaume est
Rouyn, Québec
J9X 5E4
Tel.: (819) 762-0971

Number of undergraduate students, full-time:	458
Number of undergraduate students, part-time:	1711
Number of post-graduate students, part-time:	80

Principal faculties (modules):
- Administrative studies
- Accounting
- Applied sciences
- Social sciences
- Health sciences
- Education
- Behavioural sciences

Organization of Northern Studies

The Université du Québec en Abitibi-Témiscamingue obtained its letters patent in October 1983. In its first development plan UQAT stated its mission of promoting research related to the northern way of life and the development of the resources of the land.

With the aid of those members of its teaching staff who display interest in northern activities, UQAT has engaged in three projects:

- Training Inuit teachers: the project is being carried out at Povungnituk and Ivujivik under the direction of Professor Charles Bergeron, Head of the Department of Education.
- UQAT is also administering a project aimed at the upgrading of the skills of teachers of French as a working language in Amerindian communities. One project is under way among the Algonquins of Lac Simon, and another is being developed in co-operation with the Cree School Commission. This project is also under the direction of Professor Bergeron.
- UQAT has also launched a research and development project in connection with the assumption by a native school commission of responsibility for the educational affairs of the Algonquin Band Council at Lac Simon. The director is Professor Jean-Pierre Marquis of the Department of Social and Health Sciences.

A year ago UQAT acquired the Northern Documentation Centre from the James Bay Development Corporation (SDBJ). The Centre's holdings comprise more than 10,000 documents, a map library, a collection of air and satellite photographs of the James Bay territory, a slide collection and a computerized bank of environmental data, covering the entire territory affected by the development of the La Grande River complex.

Last year, la Société d'énergie de la Baie James donated laboratory equipment from LG-2 — Radisson. The university will have a well-equipped environmental studies laboratory.

Choice of courses related to the North

The Université du Québec en Abitibi-Témiscamingue does not include in the courses it offers any which are specifically related to the North. In the context of their various activities the professors are encouraged to adapt content and teaching methods to the needs and cultural conditions of the students from native communities.

Teaching in the North

The university responds to specific requests from the native communities. Instruction is given in the villages where the students reside.

Transferability of credits

UQAT has at present no policy on transferability of credits between technical colleges and the university.

Northern research

Our university is still a very young institution and its northern activities have only just commenced; consequently, the research sector is still waiting to be developed.

Professors who are especially interested in northern development:

Professors Charles Bergeron, Gisèle Maheux, Jean-Pierre Marquis: development of educational services in northern areas with low-density settlement.

Professors Enrique Colombo, Jean-Pierre Marquis, Micheline Potvin: regional development in northern conditions.

Native studies

Having due regard to its available teaching resources the university is directing its efforts particularly to education and the social sciences.

QUEEN'S UNIVERSITY
KINGSTON, ONTARIO

General information

Queen's University, Kingston, Ontario K7L 3N6 (613-545-2000) has an enrollment of about 8000 undergraduate students and 2000 graduate students.

Northern Studies

The Queen's Northern Studies Group is a loose affiliation of academics and students who are working in Northern Canada. The Coordinator of the group is Dr. Robert Gilbert of the Department of Geography (613-545-6030).

Northern studies are carried out independently in a number of departments. In the *Department of Biology*, Professors Cooke, Montgomery, Harmsen and Rockwell are studying the ecology of birds near Hudson Bay (especially at Churchill) and on Melville Peninsula, and Professor Smol works on the biology of lakes on Ellesmere Island. *The field station* at La Perouse Bay near Churchill has been designated part of the Queen's University campus. In the *Department of Geology*, Professor Dyke is studying periglacial processes, especially in the intertidal areas at Churchill. Professors Burke and Sayers of the *School of Nursing* are involved in the training of student nurses at Moosonee and nearby communities. In the *Department of Music*, Professor Cavanaugh is studying the music of the native people of northern Ontario and Labrador. Professor Berry of the *Department of Psychology* and Professor Franks of the *Department of Political Studies* are working with northern peoples in their respective disciplines. In the *Department of Geography*, Professor Gilbert is carrying out work on oceanography and geomorphology on eastern Baffin Island.

Northern courses

One senior undergraduate course in the Department of Geography is concerned with the northern environment. Further information may be obtained from Dr. R. Gilbert (613-545-6030). In other departments the scientists listed in Table 1 teach undergraduate and graduate courses with substantial northern content, and each is supervising graduate students who, with the help of undergraduate assistants, and supported by funding from the Department of Indian Affairs and Northern Development, Northern Scientific Training Program, are actively involved in field research throughout the Canadian North.

Students interested in undergraduate study leading to Bachelor of Arts or Bachelor of Science degrees may contact the Chairman of Undergraduate Studies in the department in which they are interested or the Office of the Registrar for information. Students interested in graduate studies leading to the degrees of Master of Arts, Master of Science or Doctor of Philosophy are invited to contact any of the persons named in Table 1, or the Chairman of Graduate Studies in the department of interest, or the Admissions Office of the School of Graduate Studies and Research. Specific questions about transfer of credit from other institutions, or admission of students from northern Canada are addressed on an individual basis.

Table 1

FACULTY AT QUEEN'S UNIVERSITY AFFILIATED WITH THE QUEEN'S NORTHERN STUDIES GROUP

Telephone 613-545-6030

Dr. J. Berry	Department of Psychology
Dr. S. Burke	School of Nursing
Dr. B. Cavanaugh	Department of Music
Dr. F. Cooke	Department of Biology
Dr. L. Dyke	Department of Geology
Dr. N. Franks	Department of Political Science
Dr. R. Gilbert	Department of Geography
Dr. D. Harmsen	Department of Biology
Dr. R. Montgomerie	Department of Biology
Dr. R. Rockwell	Department of Biology
Ms. A. Sayers	School of Nursing Science
Dr. John Smol	Department of Biology

Distance Education

Queen's University offers a number of courses by correspondence in Economics, English Language and Literature, French Studies, German, History, Mathematics and Statistics, Philosophy, Political Studies, Psychology, Religion, Russian, Sociology and Spanish and Italian. Further information about registration and eligibility is available from the Faculty of Arts and Science, Division of Part-Time Studies.

Native Studies

Recently, Queen's University has established a committee to discuss the feasibility of developing a program to attract native Canadians to Queen's and to provide them with the special support necessary to complete programs of study, including those leading to professional degrees. The work is very much in the early planning stage at this time.

Selected references for Northern Studies

Berry, J.W., R.M. Wintrob, P.S. Sindell and T.A. Mawhinney, 1982. Psychological Adaptation to Culture Change among the James Bay Cree, Naturaliste can. (Rev. Écol. Syst.), 109, pp. 965-975.

Cavanagh, Beverley, 1982. Music of the Netsilik Eskimo: A Study of Stability and Change, Canadian Ethnology Service, Paper No. 82, National Museum of Man Mercury Series, Vols. 1 and 2, 198 p. and 372 p.

Cooke, Fred, C. Scott Findlay, Robert F. Rockwell, and Judith A. Smith, 1985. Life History Studies of the Lesser Snow Goose (*Anser Caerulescens Caerulescens*). III. The Selective Value of Plumage Polymorphism: Net Fecundity, Evolution, 39(1), pp. 165-177.

Dyke, Larry D., 1984. Frost Heaving of Bedrock in Permafrost Regions, Bulletin of the Association of Engineering Geologists, Vol. XXI, No. 4, pp. 389-405.

Dyke, Larry D., 1985. Terrain Disturbance due to Summer Off-Road Vehicle Use in Central Keewatin, Northwest Territories, Canada. Environmental Studies No. 36, Indian and Northern Affairs Canada, 47 p.

Gilbert, R., 1982. The Broughton Trough on the Continental Shelf of Eastern Baffin Island, Northwest Territories, Canadian Journal of Earth Sciences, 19 (8), pp. 1599-1607.

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UNIVERSITY OF REGINA
REGINA, SASKATCHEWAN

General information

University of Regina, Regina, Saskatchewan S4S 0A2 (306-584-4111) has 5,370 full-time and 3,750 part-time undergraduates, 110 full-time and 310 part-time graduate students. The major faculties and professional schools are:

- Administration
- Arts
  - Fine Arts
  - Humanities
  - Social Science
  - Canadian Plains Research Center
  - School of Journalism and Communication
- Education
- Engineering
- Physical Activity Studies
- Science
- Social Work
  - School of Human Justice
- University Extension
- Graduate Studies and Research
- Federated Colleges
  - Campion College
  - Luther College
  - Saskatchewan Indian Federated College
- Affiliated Programs
  - Gabriel Dumont Institute of Native Studies and Applied Research

Organization of Northern Studies

The University of Regina has a northern studies committee and has been a member of ACUNS since 1981. Northern Studies is not identified in general as a distinct area of study but social work, education, administration, science, extension, journalism and communication and the Canadian Plains Research Center have components that apply to the north. The Saskatchewan Indian Federated College (see elsewhere in this volume), the Gabriel Dumont Institute of Native Studies and Applied Research have a direct interest in Northern Studies.

Northern Studies is not a separate unit. Many of the programs that relate to the north will appear under Native Studies. The Saskatchewan Indian Federated College Library, (306) 584-8333, houses the University's *Eeniwuk Collection* — some 4,300 titles supporting research in Native Studies.

Sample northern courses

Indian Art 100 — An Introduction to American Indian Art
Indian Art History 202 — Early Canadian Indian Art in Transition
Cree 100 — Conversational Cree I
Cree 300 — Principles of Translation
Dakota 101 Conversational Dakota II
Dene 100 — Conversational Dene I
Nakota 102 — Nakota Grammar and Orthography
Ojibway 100 — Conversational Ojibway
Anthropology 234 — Ethnology of North American Indians
Indian Studies 245 — Reserves — Their History

and Development. There is a curriculum of about 25 Indian Studies courses.
Sociology 211 — Ethnic and Minority Group Relations
Administration 220 — General Band Administration — Principles of Band Management
Education — ECCU 228 — Introduction to Cross-Cultural Education
Education — ETSL 328 — Curriculum Development in English as a Second Language/Dialect for Indian Students
Social Work 405 — Studies of Indigenous Peoples for Human Service Workers
Social Work 418 — Social Work with Minorities
Human Justice 200 — The Criminal Justice System

Teaching in the North

NORTEP — The Northern Teacher Education Program, centred in La Ronge, trains northerners for teaching positions in northern Saskatchewan (see Teacher Education section of this volume). The Saskatchewan Indian Federated College offers credit programs on reserves — some in the north — to meet educational needs. Administration, education, social work and arts and science classes predominate. A bachelor's degree and certificate in Indian social work have been designed to meet that community's need. In the early 80's, an accounting class was offered to several communities in the arctic in conjunction with the Canadian Arctic Cooperative Federation Limited.

The university and the Saskatchewan Indian Federated College are currently developing a distance education Indian Administration Certificate program to meet management needs on reserves. Several years' experience has been obtained developing management and administrative programs for the Indian and Native Community.

A recent addition to the University of Regina program includes a technical vocational teacher training program for adults. Northern people have expressed interest in developing this program in modular format and using distance education to meet their needs.

For information, call (306) 584-4803.

Distance Education

The university has nearly a fifteen-year history of promoting and developing distance education to meet rural and northern needs. One project with the Canadian Arctic Cooperative Federation Limited operated and illustrated teleconferencing for teaching accounting in the north. The university is currently using teleconferencing to teach administration classes on reserves in the province and is televising live from a classroom in Regina to five communities in southern Saskatchewan. There is evidence that further development of computer courseware, the use of television and communication technology will enable distance teaching virtually anywhere. Local human resources are usually needed as well.

Interested parties in this development have included and include the Council of Yukon Indians, the Makivik Corporation, the James Bay Cree, the Government of the Northwest Territories and the Inuit Cultural Institute.

Co-op programs and special credit arrangements

The University of Regina uses the co-operative education model for several programs, including administration and engineering. There are five areas in which the co-operative education model may apply to the north:

1) Civil Engineering (Regional Systems)
2) Environmental Engineering (Chemistry, Regional Systems)
3) Computer Science
4) Oil Exploration (Geophysics)
5) Public Administration (Administration)

For information, call (306) 584-4600.

The University of Regina's university entrance program permits any Canadian or landed immigrant to take four to eight classes to qualify for university admission to a faculty. It is intended to help people have access to the university.

For information, call (306) 584-4077.

Northern research

Several University of Regina faculty have research related to the north. For the most part, however, the university has limited involvement in northern studies. In 1984, the university received $6,000 from the Northern Scientific Training Program in support of three projects.

Northern scholars and fields of interest

Austin, Bryan — Business Administration; Native Education, Accounting, Arctic in General.
Barber, Lloyd — Administration and Management; Indian and Native Affairs, Land Claims, Arctic in General.
Carefoot, James — Continuing Education; Distance Education, Arctic in General, Northern Saskatchewan.
Collier, Kenneth — Social Work; Applied Anthropology, Arctic in General, Social and Economic Development, Northern Saskatchewan.
Daniels, Douglas — Sociology; Inuit Studies, Land Claims, N.W.T.
Hanley, Thomas O'D. — Physics; Snow and Ice, Chuckchi Sea, Northern Alaska, Beaufort Sea.
Maguire, Brien — Computer Science; Distance Education, Arctic in General.
McBeath, Arthur — Education; Teacher Training, Arctic in General and Northern Saskatchewan.
Mitchell, George — Biology; Wildlife, Northern Saskatchewan.
Parslow, Geoffrey — Geological Sciences; Economic Geology, Uranium Explorations, Northern Saskatchewan.
Sauchy, David — Geography; Physical Geography, Yukon, Northern British Columbia.
Seaborne, Adrian — Geography; Economic Geography, Northern Saskatchewan.

Stalwick, Harvey — Social Work; Indian and Native Social Work Education, Northern Saskatchewan, Arctic in General.

For information, call (306) 584-4161.

Saskatchewan Indian Federated College University of Regina

Acoose, Dennis — Business Administration; Economic Development and Indian Studies
Asikinack (Blackbird), William — Indian Studies; History of North American Indian People, Contemporary Educational Development.
Bellegard, J.L. — The Cree Language.
Boyer, B. — Indian Art; Art, Music and Dance, Traditional North American Indian Philosophy.
Brass, Oliver — Psychology; Confinement on Reserves, Poverty, Crime, Incarceration, Prejudice, Discrimination.
Cote, M. — The Ojibway Language.
Demay, Joel — Journalism and Communications; Characteristics of Indian Reporting and Indian Journalism.
Dudgeon, Paul — Management and Administration; Indian Public Administration, Outreach.
Lawrence, D.F. — Education; Community Based Teacher Education.
Logan, William — Management and Administration; Management and Economic Development in Indian/Inuit Organizations, Distance Education.
Manyfingers, Morris — Indian Studies; Curriculum Development.
Ramirez, R. — International Education; Socio-Economic Development.
Stonechild, Blair — Indian Studies; International Indigenous Issues.

For information, call (306) 584-8333.

Native Studies

The faculties of administration, arts, education and social work all have a particular interest in native studies. A Bachelor of Arts with a major in Indian studies and a Bachelor of Arts with a major in native studies can be taken in Regina. As well, professional programs are available in social work and education; students may obtain an Indian social work degree or an education degree in Indian or native teacher education. Programs in administration designed for Indians are also under development.

Many other disciplines may have interests in native studies and in general, the university wishes to make its information and resources available to as large an audience as possible. Extension activity and distance education are another means of providing service and access away from the campus.

RYERSON POLYTECHNICAL INSTITUTE TORONTO, ONTARIO

General information

Ryerson Polytechnical Institute, 350 Victoria St., Toronto, Ontario M5B 2K3 (416-979-5000 — Northern Studies Extension — 6173 or 6942) is an undergraduate degree granting institution that administers a comprehensive range of degree programmes oriented towards practicality and application. The programmes, which include Applied Geography, Environmental Health, Urban and Regional Planning, Architecture, Nutrition and Family Studies, Geodetic Sciences, Computer Science, Social Work, and Radio and Television Arts, generally have a component in which students have to demonstrate competence in dealing with "Real World" situations. The Institute, which is located in downtown Toronto, currently has a full-time enrollment of 7,500 students.

History of Northern Studies

Northern Studies at Ryerson is a rapidly growing area of interest. The first major venture in this field was in 1982 when the Department of Applied Geography obtained a grant from the Donner Canadian Foundation to develop an inventory of land use potential for the Council for Yukon Indians. Since this date, and through funding provided by the Northern Scientific Training Program, the S.S.H.R.C., and the Council for Yukon Indians, interest has widened to include Northern Land Use Planning, the dynamics of growth in the north, northern nutrition, the economic structure of Indian communities and examination of population migration in the north.

Administration and scope of Northern Studies

Northern Studies are administered by a Northern Studies Committee (Chairman, Vivian Caplan Ext. 6942). This body serves to administer N.S.T.P. funding and generally oversee northern research. It is hoped that this body will be incorporated into a new Northern Studies Centre in the near future. The role of this centre will be to direct and promote both northern research and training programmes based at Ryerson.

There are no Degree programmes in Northern Studies specifically in the Institute, but the Geography, Planning, and Food and Nutrition departments have a course structure that makes it possible for students to incorporate northern interests into their curriculum. Academic courses dealing with the north can be divided into two categories, one consisting of courses dealing directly with the north and northern issues, and one consisting of courses that contain material of relevance to the north. Within the former category are three courses offered by the School of Applied Geography, an introductory course on the north, a course for planners dealing primarily with land claims and northern land use planning, and a fourth year course in the Applied Geography programme focussing on contemporary development issues in the north. The latter category includes courses offered by the departments of Politics, Sociology, History, Environmental Health, and Food and Nutrition. The Department of English intends to offer a course on northern literature in the near future.

Education and training for Northerners

Apart from providing a background in Northern Studies as a component of undergraduate studies, and apart from providing practical training in the north for undergraduates, Ryerson has a strong interest in providing practical programmes for northerners. It is appreciated that formal four year courses of study are not appropriate to the training needs of many northerners, and it is anticipated that the new northern centre at Ryerson will introduce courses for delivery to northern residents. Such courses would be relatively short and highly specialized and would be designed to provide strong grounding in an area in which practical skills are required, for example Northern Land Use Planning, Community Planning, Nutrition, Environmental Health. Courses, ideally, would not exceed two years in duration and training would take place in both the north and at Ryerson.

Ryerson projects in the North

Projects undertaken by Ryerson students and faculty in the north over the past four years have largely been concerned with practical questions. They include:

1) The Yukon Indian Lands Mapping Project. This venture, funded by the Donner Canadian Foundation and the Council for Yukon Indians, mapped out land use potential in proposed Land Claim areas and the atlases and accompanying text are now being used as a basis of the land selection process in the Yukon. The project involved members of Yukon Indian communities as well as five faculty members and twelve students from Ryerson.

2) A Delphi appraisal of Northern Land Use Planning. The proposed NLUP programme will impact on any group or individual with interests in land use. The manner in which groups with land use interests will be involved in planning is not very clearly defined, and if planning is to proceed smoothly an assessment of participant expectations and concerns is required. In the course of the project major potential participants in the planning process were identified and their hopes and concerns regarding planning recorded. Major concerns and interests were then summarized and participants were then asked to comment further on this summary. In this manner the collective aspirations and major reservations of a diverse group of participants could be identified.

3) Nutritional Research. Directed by the Department of Food and Nutrition, students from Ryerson investigated the incidence of cardiovascular disease and diabetes in Yellowknife and Whitehorse. The results of this work will be incorporated into intervention programmes aimed at lowering the incidence of these diseases. Data gathered on prenatal nutrition in Yellowknife will be used in the preparation of a manual on prenatal nutrition.

4) The Economy of Teslin, Yukon. The Indian community at Teslin has an economy which, by conventional measures, is very weak. This project, which was conducted at the invitation of the Teslin Indian Band, assessed the strength of the economy from the standpoint of traditional pursuits and identified possible non-traditional economic endeavours that would be compatible with traditional life and land-use.

5) Economic Linkages and Population Mobility in Whitehorse. Beyond the presence of high profile activities such as mining, economic growth and stability in northern regions is closely tied to the ability of the economic infrastructure to ensure that money earned in the North stays in the North, as well as to the emergence of self-sustaining population growth. In order to gauge the extent to which there is propensity for growth to be transmitted within the Yukon, students of the Applied Geography and the Planning Departments surveyed Whitehorse businesses, using the resultant information in order to obtain a picture of leakages in the Yukon economy. A significant sample of the Whitehorse population was also surveyed in order to obtain data on population mobility and personal expenditure patterns. The resulting data were used to supplement the economic leakage information as well as gauge the extent to which population growth and stability are attributable to family formation as opposed to a flow through of migrants.

Further information on Northern Studies and training interests at Ryerson can be obtained by contacting either:

Milton Orris — Dean, Continuing Education (ext. 5005)
Vivian Caplan — Chairman, Northern Studies Committee (ext. 6942)
Frank Duerden — ACUNS rep. (ext. 6173)

UNIVERSITY OF SASKATCHEWAN
SASKATOON, SASKATCHEWAN

General information

University of Saskatchewan, Saskatoon, Saskatchewan, S7N 0W0, (306-244-4343) has 12,100 full-time, 1,000 part-time undergraduates, 940 full-time, 340 part-time graduate students. Its major faculties and professional schools are:

COLLEGE OF AGRICULTURE
— full-time enrollment — 555
— part-time enrollment — 44
Areas of specialization:
Agricultural Biology, Agricultural Chemistry, Agricultural Economics, Agricultural Microbiology, Agronomy, Animal Science, Applied Microbiology and Food Science, Crop Science, Economics, Horticulture, Mechanized Agriculture, Parks and Recreation, Plant Ecology, Poultry Science and Soil Science.

COLLEGE OF ARTS AND SCIENCE
— full-time enrollment — 5,240
— part-time enrollment — 619
Areas of specialization:
Fine Arts: Art, Drama, Music
Humanities: Classics, English, French, German, Greek, History, Latin, Linguistics, Philosophy, Religious Studies, Slavic Studies, Spanish, Ukrainian
Natural Sciences: Biology, Chemistry, Computational Science, Geological Sciences, Mathematics, Physics
Social Sciences: Anthropology, Economics, Geography, Native Studies, Political Science, Psychology, Sociology

COLLEGE OF COMMERCE
— full-time enrollment — 1,296
— part-time enrollment — 106
Areas of specialization:
Accounting, Computational Science, Economics, Finance, General Business, Health Care Administration, Industrial Relations, Marketing, Quantitative Analysis

COLLEGE OF DENTISTRY
— full-time enrollment — 102

COLLEGE OF EDUCATION
— full-time enrollment — 1,986
— part-time enrollment — 161
Areas of specialization:
Program for Elementary School Teachers, Indian Teacher Education Program, Northern Teacher Education Program, Saskatchewan Urban Native Teacher Education Program, Program for Secondary School Teachers, Program for Industrial Arts Teachers, Program for Vocational Teachers, Various programs for graduates from other colleges with approved degrees

COLLEGE OF ENGINEERING
— full-time enrollment — 1,056
— part-time enrollment — 21
Areas of specialization:
Agricultural Engineering, Chemical Engineering, Civil Engineering, Electrical Engineering, Geological Engineering, Geophysics, Mechanical Engineering, Engineering, Physics

COLLEGE OF HOME ECONOMICS
— full-time enrollment — 223
— part-time enrollment — 10
Areas of specialization:
Family and Consumer Studies, Foods and Nutrition

COLLEGE OF LAW
— full-time enrollment — 308
Areas of specialization:
Program leading to the L.L.B. degree, Program of Legal Studies for Native People

COLLEGE OF MEDICINE
— full-time enrollment — 300
Areas of specialization:
Basic Health Sciences: Anatomy, Biochemistry, Microbiology, Pathology, Pharmacology, Physiology
Clinical Medicine: A full-range of specialties in Clinical Medicine

COLLEGE OF NURSING
— full-time enrollment — 368
Areas of specialization:
Degree Nursing Program for High School Graduates, Degree Program for Registered Nurses, Preparatory Program for Students of Native Ancestry

COLLEGE OF PHARMACY
— full-time enrollment — 260
— part-time enrollment — 5

COLLEGE OF PHYSICAL EDUCATION
— full-time enrollment — 352
— part-time enrollment — 23

SCHOOL OF PHYSICAL THERAPY
— full-time enrollment — 64

WESTERN COLLEGE OF VETERINARY MEDICINE
— full-time enrollment — 282

SCHOOL OF AGRICULTURE
— full-time enrollment — 230
A two-year program leading to a certificate

CERTIFICATE IN BUSINESS ADMINISTRATION
— enrollment — 518
A two-year program leading to a certificate

COLLEGE OF GRADUATE STUDIES AND RESEARCH
— full-time enrollment — 940
— part-time enrollment — 340
Training to the Master's and Doctoral level is available in the majority of the fundamental disciplines offered by the University of Saskatchewan.

DIVISION OF EXTENSION AND COMMUNITY RELATIONS
Non-degree and degree programs are offered by means of part-time, off-campus, and independent study courses coordinated by the Division.

ST. THOMAS MORE COLLEGE
A federated theological college academically integrated with the University of Saskatchewan offering classes in several of the departments of the College of Arts and Science.

AFFILIATED THEOLOGICAL COLLEGES:

CENTRAL PENTECOSTAL COLLEGE
1303 Jackson Avenue
Saskatoon, Saskatchewan S7H 2M9
(306) 374-6655
Areas of specialization:
Master of Divinity, Bachelor of Theology, and Diploma of Theology programs and a one-year Certificate of Lay Ministries program, operated by the Pentecostal Assemblies of Canada.

COLLEGE OF EMMANUEL AND ST. CHAD
1337 College Drive
Saskatoon, Saskatchewan S7N 0W6
(306) 343-1353
Areas of specialization:
Master of Divinity, Bachelor of Theology, and Master of Sacred Theology programs, operated by the Anglican Church of Canada.

LUTHERAN THEOLOGICAL SEMINARY
114 Seminary Crescent
Saskatoon, Saskatchewan S7N 0X3
(306) 343-8204
Areas of Specialization:
Master of Divinity, Bachelor of Theology, Master of Theological Studies, Master of Sacred Theology, and Certificate of Ministry programs.

ST. ANDREW'S COLLEGE
1121 College Drive
Saskatoon, Saskatchewan S7N 0W3
(306) 966-8970
Areas of Specialization:
Bachelor of Theology, Master of Divinity, Master of Theological Studies, and Master of Sacred Theology programs, operated by the United Church of Canada.

ST. PETER'S COLLEGE
Box 10
Muenster, Saskatchewan S0K 2Y0
(306) 682-5431
A Junior College with boarding facilities offering courses in Arts and Science.

Organization of Northern Studies

In January, 1960, the Board of Governors of the University of Saskatchewan authorized the establishment of the *Institute of Northern Studies* and appointed Dr. J.B. Maudsley as its first Director. The aim of the I.N.S. was to further the development and appreciation of the Canadian North and help the University to play an important role in this work. In its first year of operation research was undertaken in biology, plant ecology, economics, geology, and radio communications. In later years the breadth of activities expanded to include other fields, most noticeably anthropology, archaeology, law, political science, and geophysics. The I.N.S. acquired a field station, the Arctic Research Training Centre (ARTC) at Rankin Inlet, with help from the Donner Canadian Foundation. Publication of the *Musk-Ox*, a journal on the North, commenced in 1967. The progress of I.N.S. can be traced through the 19 Annual Reports that were issued between 1960 and 1979. The I.N.S. was disbanded in the summer of 1982.

Since the Institute of Northern Studies was discontinued, northern studies and research at the University of Saskatchewan have been guided by the Committee on Northern Studies which reports to the Dean of Graduate Studies and Research. Operation of the Arctic Research and Training Centre was also discontinued and the building at Rankin Inlet was sold to private interests. The I.N.S. Library is now part of the collection of the Main Library, Government Publications and Microforms Department, University of Saskatchewan, Saskatoon, SK, S7N 0W0. Telephone (306) 966-5986.

Selected northern courses

Department of Biology:

Courses with some northern content: Biology of the Lichens, Biol. 322; Wildland Ecology (focus on Boreal Forest Ecology), PlEc. 412, 831; Plant Geography, Biol. 425; and the Honours Field Course which is held at a boreal forest site, Biol. 350.

Department of Animal and Poultry Science:

While no courses are specifically directed to Northerners, all pertain to food animal production and many contain information of particular interest to those concerned with food production in the North. Courses on production, management, feeding and nutrition, breeding and genetics, and behavior are available and described in the University Calendar.

Department of Geological Sciences:

The Department of Geological Sciences provides basic courses on geology and geophysics with substantial northern content where such is warranted. Classes in Economic Geology dealing with mines and petroleum, for instance, rely on many northern examples. Most instructors of these courses have had northern experience which is passed on to students.

Department of History:

The Canadian North from 1870, Hist. 405 805.

Courses with some northern content: History of the Canadian Prairies, Hist. 209; Russian History from the Ninth Century to the present, Hist. 210.

College of Law:

Courses with some northern content: Mining Law (deals with mining rights in northern Canada), Law 446;

International Law (deals with sovereignty over polar areas and pollution in northern seas) Law 457; International Law (deals in part with problems relating to the Inuit and other inhabitants of the North), Law 458; and Environmental Law (deals with the delicate northern environment), Law 444.

Department of Native Studies:

Cree 101 (introductory language); Cree 120 (intermediate language); Native People and Northern Development, Natst. 401; Critical Perspectives in Native Studies, Natst. 403.

In addition, the Department of Native Studies offers a number of courses on such topics as Native health issues, Native people and the criminal justice system, and several history courses that have a significant northern component.

Department of Slavic Studies:

Courses with some northern content: Fundamentals of Soviet Culture, Russ. 301.

Native Law Centre:

Program of Legal Studies for Native Peoples (pre-law orientation program).

Teaching in the North

Indian Teacher Education Program (ITEP)

The ITEP organization within the College of Education co-ordinates and administrates both on- and off-campus programs. Indian Bands in Northern Saskatchewan have contracted some off-campus courses so that their students could participate in the program without having to leave their residences. Students may attend classes on campus, and those desiring to complete a fourth year of Education for a B.Ed. degree are required to spend their final year on campus. Most off-campus courses are offered through the College of Education, but several departments of the College of Arts and Science also participate.

Northern Teacher Education Program (NORTEP)

The NORTEP was initiated as a means of increasing the number of Native teachers in the North. It is an off-campus training program offered in co-operation with the University of Saskatchewan and the University of Regina. The NORTEP Centre at LaRonge, northern Saskatchewan, houses the administrative and teaching facilities. Students come to the Centre in LaRonge for classes, which are given in a series of 2 weeks/month units, and return to schools in their home community, where they work with a co-operating teacher for the classroom component of their training. The program involves three years off-campus and a fourth year on-campus, leading to the B.Ed. degree and eligibility for a Professional "A" Certificate. Most courses are offered through the College of Education, with additional courses being offered by the Department of English (Introductory English), and the Department of Native Studies (Introduction to Native Studies, History of the Metis and Non-Status People of Canada).

Saskatchewan Urban Native Teacher Education Program (SUNTEP)

The SUNTEP program is sponsored by the Gabriel Dumont Institute of Native Studies and Applied Research. Courses are offered by the College of Education and the Department of Native Studies through centres located at Prince Albert and on the University of Saskatchewan Campus.

(See Teacher Education section of this volume for further information on NORTEP and SUNTEP.)

Department of Biology

Honours Field Course, Biol. 350 is given at a boreal forest location.

College of Commerce

INDIAN BUSINESS ADMINISTRATION PROGRAM — The College of Commerce in conjuction with Indian leaders and the Department of Indian Affairs has developed the Indian Business Administration Program (IBAP) which is offered on a contract basis to the Indian districts. The two year program is offered in the district during the regular academic year and is supplemented with summer courses taken on campus. Successful completion of the program which includes first and second year courses from both Commerce and Arts and Science results in the award of a certificate and may qualify students for admission to either the College of Commerce or the College of Arts and Science. This program is offered on a contract basis when off-campus, and under suitable conditions could be offered in the North.

In addition to providing students with an opportunity to gain access to university courses and certification of their accomplishments, the program has a non-credit portion which provides additional academic and business skills. The non-credit portion is an integral part of the program which helps smooth the students' transition into academic and business life.

HEALTH CARE ADMINISTRATION CERTIFICATE PROGRAM — This is a two-year home-study program for those individuals interested in Health Care Administration. The program format is more suitable to those persons working in the field, specifically in hospitals or special care facilities. However, others not working in the field can apply and, provided they have access to a health care institution, can do very well.

The program is suitable for northerners as principles in health care administration are generic. Assignments are structured so students are able to use the information and facilities accessible to them in the development of their response. A Preceptor in the student's geographic area is assigned to each student to assist with conceptual problems and issues. The Preceptor holds specific tutorial sessions for his/her students. At the end of each year, students attend the University of Saskatchewan for a two week seminar. During this time, additional lectures are given, discussions are held, and examinations are written. Students are able to meet a wide variety of persons from all avenues of the health care field and as such develop a network. The program exists primarily for those individuals who live in areas where access to a major educational facility is non-existent.

College of Medicine

Fourth and fifth year medical students may take one month electives at Northern Outpost Hospitals such as those at LaRonge, Loon Lake, and Ile à la Crosse, northern Saskatchewan.

Distance Education

Division of Extension and Community Relations

Non-degree programs are offered in co-operation with community colleges and with various agencies and community organizations in the following areas: Agricultural Science, Business and Professional Studies, Liberal Studies, Rural Development Education, Services to Organizations, U Learn, and Women's Studies.

Degree programs are offered without the need of becoming a full-time student through the following course offerings: Intersession, Summer Session, Evening, Off-Campus, and Independent Study Courses. Off-campus courses are available in outlying centres in Saskatchewan through the community college system. Independent Study Courses in a wide variety of disciplines are available by correspondence.

Contact:
Division of Extension and Community Relations
University of Saskatchewan
Saskatoon, Saskatchewan S7N 0W0
(306) 966-5560

Division of Audio Visual Services

The Division of Audio Visual Services has become increasingly involved in the production of materials for off-campus use. Experimental broadcast of educational programs via Anik satellites for use in classes in Northern Saskatchewan has met with success. Continued programming in distance education has dealt primarily with agricultural topics and has been aimed at Saskatchewan audiences. Positive results from these trials and continuing projects have encouraged DAVS to pursue expansion of its distance education programming.

Co-op programs and special credit arrangements

The University of Saskatchewan accepts for transfer of credit courses taken at all other Canadian universities and most colleges offering courses or programs recognized as equivalent to university level instruction. Courses offered through NORTEP, ITEP, SUNTEP, Division of Extension, and correspondence are, of course, accredited. Questions regarding transfer of credit should be directed to the Office of the Registrar.

Northern research

Projects

Department of Anatomy:

Renal morphology and function of the Ringed Seal. I. Munkacsi and J.D. Newstead. Whale Cove, NWT.

Department of Animal and Poultry Science:

Feasibility of poultry and livestock production in northern settlements. Re-establishment of the Canadian Eskimo Dog as a pedigreed and recognized breed. R.D. Crawford, C.M. Williams. Northwest Territories, Northern Saskatchewan.

Department of Biology:

The Department of Biology is engaged in many projects throughout the North. Principal programs are listed below.

(1) Vegetation and flora of the Lake Athabasca south shore sand dunes.
(2) Traditional ethnobotany of the Chipewyan and Cree of northern Saskatchewan.
(3) Vegetation and fire ecology of the Caribou Range, N.W.T.
(4) Flora of Northern Saskatchewan.
(5) Taxonomy and ecology of rare and endemic plants of northern Saskatchewan.
(6) Revegetation of uranium mining disturbed and waste sites in northern Saskatchewan.
(7) Accumulation of radionucleotides in northern Saskatchewan plants.
(8) Physiological ecology of northern C4 grasses.
(9) Migration of Mackenzie District Raptors.
(10) Ecology and behaviour of arctic Jaegers.
(11) Taxonomy and ecology of aquatic insects in northern Saskatchewan (*Trichoptera*, Chironimidae, Mayflies, *Plecoptera*, Caddisflies, *Ephemerata*, Diptera: Simuliidae).
(12) Avifauna of the Rankin Inlet area, N.W.T.
(13) Ecology of Sphaeriidae (Pill or Fingernail Clams) in northern Saskatchewan.
(14) Taxonomy and ecology of *Diplolepis* insect gall-formers on Rose leaves in northwestern Canada.
(15) Physiology of Cervids in northern Canada.
(16) Population study (breeding behaviour and food ecology) of Bald Eagles in northern Saskatchewan.
(17) Logging and regeneration of northern Saskatchewan forests.
(18) Vegetation and Ecology of southern Prince Albert National Park grasslands.
(19) Taxonomy and ecology of aquatic insects in the vicinity of Rankin Inlet, N.W.T.
(20) Flora, plant communities, and fire ecology of the Rankin Inlet, N.W.T., area.
(21) Ecology of the Northern Lake Club in northern Saskatchewan.
(22) Reproductive physiology and ethology of Goldeyes, *Hiodon alosoides*, in northern Saskatchewan and northeast Alberta.
(23) Lichen ecology in the boreal forest, northern Saskatchewan.
(24) Ecology and behaviour of Arctic Grayling, *Thymallus arcticus*, in northern Saskatchewan.
(25) Creche formation by Lesser Scaup and Red-head broods in northern Saskatchewan.
(26) Stability and response to perturbation in High Arctic plant communities at Polar Bear Pass, Bathurst Island, N.W.T.
(27) Endocrinology of reproduction of male Ferrett.
(28) Nutritional status of Bison in Slave River Valley

with comparison of forage utilisation by Wood Buffalo and Cattle.
(29) Pulp-cutting influence and vegetation succession on small mammal populations of northern Saskatchewan.
(30) Ecological perspectives on Ruffed Grouse and their habitats.
(31) The feeding ecology and habitat selection of certain waterfowl species of ducks along the Churchill and Reindeer Rivers, northeastern Saskatchewan (Mallard, Golden Eye, Common Merganser).
(32) Reproductive strategies of lichens in boreal lichen woodlands in northern Saskatchewan.
(33) Use of native species in revegetation of uranium mine tailings at Uranium City, northwestern Saskatchewan.
(34) Fish reproduction in acid waters of northern Saskatchewan.
(35) Ecology of northern squirrels.
(36) Vegetation of Candle Lake area.
(37) Ethnobiology of Slave Indians, Mackenzie District, N.W.T.
(38) Hunting ecology and habitat utilization of the Peregrine Falcon at Rankin Inlet, N.W.T.
(39) Walleye populations in Cumberland and Namew Lakes, northern Saskatchewan.

College of Dentistry:

The College of Dentistry operates dental clinics in several Indian reservations in Northern Saskatchewan in order to provide dental care to residents of remote communities, to improve the level of care available in these communities, and to monitor improvement in dental health among residents. This program is meeting with high success in terms of clinical results, community participation, and assistance by the community in operation of clinics and maintenance of equipment. J.D. Wray.

Department of Economics:

Regional and urban economics and economic development in Northern Canada. Projects and research usually requested and sponsored by territorial and civil governments, federal commissions, and northern committees and institutes. J. Stabler, Yukon, Northwest Territories.

Department of Geological Sciences:

Stratigraphy and paleontology of Phanerozoic rocks in the Mackenzie Basin, Yukon, and Arctic Islands. Coal-bearing rocks and fossil plants of northern Canada, including the Arctic Islands. Geophysical studies of permafrost and crustal structures in the arctic slope. Economic geology of metallic deposits in Precambrian rocks with special emphasis on uranium deposits in northern Saskatchewan.

Department of History:

Siberian regionalism; development of culture, the press, and education in Western Siberia. G.A. Hanson.

History of Indian residential schools in Canada. J. Miller.

History of early Biological and Geological Surveys. W.A. Waiser.

College of Medicine:

The departments of Orthopedics, Medical Genetics, and Medical Imaging carry out from time to time research projects on specific health problems in Northern Saskatchewan.

Department of Microbiology:

The Department of Microbiology participates from time to time in studies related to infectious diseases in the North and anticipates development of an active Infectious Disease Program within the College of Medicine. The Department also anticipates development of a close relationship with the emerging Department of Northern Medical Services.

Department of Northern Medical Services:

The College of Medicine is currently developing a Department of Northern Medical Services to deal with specific concerns of Northern residents regarding health care in the North. Questions at this time should be directed to the Dean, College of Medicine.

Native Law Centre:

Canadian sovereignty, Inuit occupancy, and international standards for the treatment of indigenous peoples. D.R. Thompson. Northwest Territories.

Department of Native Studies:

Community research program aimed at determining the net and gross income levels from trapping and fishing in the communities of Patuanak and Ile à la Crosse. R. Bourgeault.

Study on Native people and the regional economy of northern Manitoba covering the period 1870 to 1930. F. Tough.

Impact of hydro-electric development on Cree communities in northern Manitoba; and a social and economic impact study dealing with the effects of the Squaw Rapids Dam at Cumberland House. J. Waldram.

Department of Physiology:

Control and mechanism of protein degradation in brown adipose tissue and the regulation of body temperature and overall energy balance. M. Desautel.

Physiological regulation of deep body temperature, feeding behavior, and blood pressure responses to the alteration of core temperature responses in animals adapting to severe ambient temperature changes. J. Thornhill.

Toxicology Research Centre:

Toxicology of a herbicide, "Roundup", used in silviculture. D. Irvine. Northern Saskatchewan.

Field stations

The University of Saskatchewan has sold the Arctic Research Station at Rankin Inlet, NWT, and no longer retains a field station in the North.

Involvement of Northerners

The Department of Anthropology and Archaeology relies extensively on assistance by Northerners in carrying out northern research and study. In documentation of oral history, in sociological, historical, and ethnobotanical investigation, in archaeological site location and excavation, and in many other anthropological studies the support and involvement of northern residents is critical to success of the projects.

Guidance and transportation is frequently provided by northern residents during geological, geographical, and biological work. Studies of wildlife reproduction and ecology are conducted by the Western College of Veterinary Medicine with the aid of indigenous northerners and carried out in conjunction with annual harvest, in order to contribute to sound wildlife management programs. Management of the Banks Island Musk Ox herds is an example of W.C.V.M.'s areas of concerns.

Northern Scientific Training Program

The University of Saskatchewan has a long record of active involvement in the Northern Scientific Training Program. Graduate students and senior undergraduates from many fields of the Life, Social, and Earth Sciences are assisted annually in conduct of research programs in the North. Each year, ten to fifteen students are awarded NSTP grants. Grants do not normally exceed $6000 and typically average between $2000 to $3000. The Program is administered by the College of Graduate Studies and Research through the Committee on Northern Studies.

Northern specialists

BARR, William Department of Geography, Historical Geography, Human Geography, Land Use, Northwest Territories.

BARRON, F.L. Department of Native Studies, Education, Native Peoples, Northern Saskatchewan.

BARTLETT, R. College of Law, Law, Arctic in general.

BASINGER, James F. Department of Geological Sciences, Paleontology, Yukon, Mackenzie District, Queen Elizabeth Islands.

BONE, Robert M. Department of Geography, Economic Geography, Mackenzie District.

BOURGEAULT, R. Department of Native Studies, Sociology, Northern Saskatchewan.

BOWDEN, M.A. College of Law, Law, Arctic in general.

BOYLE, A.R. Department of Electrical Engineering, Electrical Engineering, Cartography, Northwest Territories.

BRAUN, Willi. Department of Geological Sciences, Paleontology, Stratigraphy, Yukon, Mackenzie District.

BRENNAN, J. College of Commerce, Business Administration, Northwest Territories, Northern Saskatchewan.

CALDWELL, W.G.E. Department of Geological Sciences, Paleontology, Stratigraphy, Mackenzie District.

CHAKRAVARTI, A.K. Department of Geography, Meteorology, Northern Saskatchewan.

CHEN, M.Y. Saskatchewan Fisheries Laboratory, Ichthyology, Environmental Science, Fishing, Northern Saskatchewan.

COLEMAN, L.C. Department of Geological Sciences, Mineralogy, Northwest Territories.

CRAWFORD, R.D. Department of Animal and Poultry Science, Animal Science, Poultry Production, Dog Breeding, Northwest Territories, Northern Saskatchewan.

DAVIS, Eric Department of Civil Engineering, Civil Engineering, Hydrology, Northern Saskatchewan.

DEWER, J.D. College of Physical Education, Education, Teacher Training, Northwest Territories.

DYER, Aldrich J. Indian & Northern Education Program, Education, Northern Peoples, Northwest Territories.

ERVIN, A.M. Department of Anthropology and Archaeology, Cultural Anthropology, Alaska, Yukon.

FLOOD, Peter Department of Veterinary Anatomy, Veterinary Medicine, Wildlife, Beaufort Sea, Queen Elizabeth Islands.

FORGIE, David J.L. Department of Civil Engineering, Civil Engineering.

GENDZWILL, D.J. Department of Geological Sciences, Geophysics, Northwest Territories.

GRAY, Donald M. Division of Hydrology, Hydrology, Snow and Ice, Arctic in General.

HAIGH, Jeremy C. Department of Herd Medicine & Theriogenology, Veterinary Medicine, Wildlife, Northwest Territories.

HAMMER, U.T. Department of Biology, Limnology, Northern Saskatchewan.

HANSON, G.A. Department of History, History, Western Siberia.

HARMS, Vernon L. Department of Biology, Botany, Plant Ecology, Northwest Territories, Northern Saskatchewan.

HOLMLUND, B.A. Department of Computational Science, Computational Science, Keewatin.

HOUSTON, C. Stuart Department of Medical Imaging, Ornithology, History, Arctic in General.

IVERSEN, John O. Department of Veterinary Microbiology, Microbiology.

KENNEDY, J.E. Department of Physics, History-Expeditions, Northwest Territories.

KOENIG, D.M. Department of Indian and Northern Education, Education, Native Peoples, Northwest Territories.

KUPSCH, Walter O. Department of Geological Sciences, Geomorphology and Glacial Geology, Stratigraphy, Sedimentation, Arctic in General, Northern Saskatchewan.

LANGFORD, Fred F. Department of Geological Sciences, Geological Sciences General, Northern Saskatchewan.

LEHMKUHL, D.M. Department of Biology, Entomology, Ecology, Northwest Territories, Northern Saskatchewan.

LIAW, W.K. Saskatchewan Fisheries Laboratory, Limnology, Ichthyology, Environmental Science, Fishing, Northern Saskatchewan.

LINNAMAE, Urve Department of Anthropology & Archaeology, Archaeology, Inuit, Arctic in General.

LLEWELLYN, Edward J. Institute of Space & Atmospheric Studies, Upper Atmospheric Studies, Antarctica.

MAHER, William J. Department of Biology, Ornithology, Ecology, Northwest Territories.

MARINO, M.C. Department of Anthropology and Archaeology, Languages, Indian, Northern Saskatchewan, Canada Subarctic.

MATTHEWS, Vincent L. Department of Social and Preventive Medicine, Social and Preventive Medicine, Arctic in General, Northern Saskatchewan.

MCCONNELL, John G. Department of Geography, Historical Geography, Northwest Territories, Northern Saskatchewan.

MCCONNELL, W.H. College of Law, Political Science, Law, Northwest Territories.

MCEWEN, Donald J. Institute of Space & Atmospheric Studies, Upper Atmospheric Studies, Arctic in General.

MILLAR, James F.V. Department of Anthropology & Archaeology, Archaeology, Mackenzie District.

MILLARD, P.T. Department of English, Art, Northwest Territories.

MILLER, J.R. Department of History, Indian Studies, Canada, general.

MILLIGAN, Shirley M. Department of Geological Sciences, Political Science, Law, Arctic in General.

MUNKACSI, I.M. Department of Anatomy, Mammalogy; Human Biology, Canadian Arctic Islands Waters.

NEWSTEAD, J.D. Department of Anatomy, Canadian Arctic Islands Waters, Human Biology, Mammalogy.

OLIPHANT, L.W. Department of Veterinary Anatomy, Ornithology, Wildlife, Northwest Territories, Northern Saskatchewan.

PAULSON, Kenneth V. Department of Physics, Geophysics, Solid Earth, Permafrost, Mackenzie District.

PURICH, D.J. Native Law Centre, Law, Northwest Territories.

REDMAN, R.E. Department of Crop Science and Plant Ecology, Ecology, Forestry, Northwest Territories, Northern Saskatchewan.

ROWE, J. Stanley. Department of Crop Science and Plant Ecology, Plant Ecology, Forestry, Northern Saskatchewan, Canada-Subarctic.

SARJEANT, W.A.S. Department of Geological Sciences, Paleontology, Northwest Territories.

SCHMUTZ, Josef K. Department of Biology, Ornithology, Ecology, Northwest Territories, Yukon, Northern Manitoba.

SHEARD, John W. Botany, Plant Ecology, Lichenology, Northwest Territories, Northern Saskatchewan.

SILVERSIDES, F.H. College of Commerce, Hospital Administration, Northwest Territories.

SMITH, J. Department of Biology, Ichthyology, Behavioral Studies, Northern Saskatchewan.

SPINKS, J.W.T. Department of Chemistry, Chemistry, Northern Saskatchewan.

STABLER, Jack C. Department of Economics, Economic Development, Regional Development, Urban & Regional Planning, Yukon Territory, Northern Saskatchewan, Northwest Territories.

STAUFFER, M.R. Department of Geological Sciences, Structural Geology, Northern Saskatchewan.

THOMPSON, R. Native Law Centre, Law, Northwest Territories.

TOUGH, F. Department of Native Studies, Historical Geography, Northern Manitoba.

TYMCHAK, Michael J. Northern Teacher Education Program (NORTEP), Education, Northern Peoples, Northwest Territories, Northern Saskatchewan.

WAISER, W.A. Department of History, History, Arctic in General, Yukon.

WALDRAM, J. Department of Native Studies, Cultural Anthropology, Northern Saskatchewan, Northern Manitoba.

WATSON, Linvill Department of Anthro ology & Archaeology, Anthropology-Social/Cultural, Keewatin District.

WILLIAMS, Charles M. Department of Animal & Poultry Science, Animal Science, Northwest Territories, Northern Saskatchewan.

WILLIAMSON, K. Department of Anthropology and Archaeology, Languages, Inuktitut, Linguistics, Arctic in general, Northwest Territories.

WILLIAMSON, R.C. Department of Anthropology and Archaeology, Cultural Anthropology, Greenland, Arctic in General, Northwest Territories.

WILSON, Michael R. Department of Geography, Geography, Northern Saskatchewan.

WOBESER, Gary Department of Veterinary Pathology, Veterinary Medicine, Northwest Territories.

WOODS, R.J. Department of Chemistry, Environmental Studies, Northern Saskatchewan.

WRAY, J.D. College of Dentistry, Dentistry, Yukon.

Native studies

The Native Law Centre

The Native Law Centre maintains an active research program with special consideration of: Native hunting and fishing rights; the Constitution; the Indian Act; the development of international standards for the treatment of indigenous peoples; and issues of land and aboriginal rights. The Centre has a specialized library accessible through inter-library loan and occasionally direct loan. The Centre also publishes research articles and a quarterly journal, the *Canadian Native Law Reporter*, which often carries judicial reports from northern Canada. For additional information, contact: Dr. D.J. Purich, Native Law Centre, (306) 966-6189.

The Department of Native Studies

The Department of Native Studies has developed an undergraduate program which emphasizes Canadian content, research, and research methodology. It offers a three-year Bachelor of Arts degree, a four-year Advanced degree and a four-year Honours degree. In addition, the department is able to offer a Masters program on an individual, case-by-case, basis and presently is preparing a program of study for its first Master's student who will begin graduate studies next September.

The department employs six full-time and seven sessional faculty members. Collectively, these instructors offer some twenty-five courses (or section equivalents) with a total enrollment of about five hundred students, forty-five percent of whom are of Native ancestry.

Supplementary to its teaching program, the department is also heavily involved in a range of scholarly activities. In 1984-5, the five full-time faculty members produced some twenty conference papers and twenty-one publications. In the same year, the department hosted a major conference on the Northwest Rebellion of 1885. It brought together both native and non-Native academics from across Canada and the United States and highlighted a series of papers by leading experts in the Native Studies field. On an annual basis, the department sponsors a lecture series featuring leading academics from across Canada. In addition, we publish the *Native Studies Review*, a refereed academic journal focusing on all aspects of Native Studies in the western Canadian context. The *Review* is one of only two Native Studies journals in all of Canada. Finally, the faculty is very much interested in student exchange programs. We are presently engaged in an exchange of students with Laval University and arrangements are currently being made for an exchange of Native students with a college in Adelaide, Australia.

Other services and organizations

Division of Audio Visual Services (DAVS)

DAVS is a centralized facility providing audio visual support to all colleges and related research or instructional units at the University of Saskatchewan. Production Services provides television support for creation of instructional programs for on- or off-campus use. Unitel is a documentary program on university research and teaching broadcast weekly in Saskatchewan. Also available is assistance with slide-tape and audio presentations. Equipment Services provides and maintains all audio visual equipment on campus. Photo / Graphics provides photographic and graphics support for use in research and teaching.

DAVS has become increasingly involved in production of materials for off-campus use. Experimental broadcast of educational programs via Anik satellites for use in classes in Northern Saskatchewan has met with success. Continued programming in distance education has dealt primarily with agricultural topics and has been aimed at Saskatchewan audiences. Positive results from trials and continuing projects has encouraged DAVS to pursue expansion of its distance education programming.

Centre for the Study of Co-operatives

The Centre for the Study of Co-operatives is a research centre jointly sponsored by the co-operative sector in Saskatchewan, the government of Saskatchewan, and the University of Saskatchewan with a purpose to pursue topics relevant to co-operatives and credit unions. Objectives of the Centre include: 1) establishment of a program of studies with a focus on co-operatives; 2) undertake off-campus programs in collaboration with the Co-operative College of Canada; 3) undertake and publish research of interest and relevance to co-operatives; and 4) undertake research concerning legislation and governing of co-operatives and credit unions.

The Centre is currently engaged in a very wide variety of research activities. These include: native and northern native co-operatives; the role of co-operatives in development; worker co-operatives; co-operative health care clinics; housing co-operatives, fisheries co-operatives, capital formation in co-operatives; the role of directors in co-operatives; co-operative legal history; co-operative and credit union legislation; the role of co-operatives in developing countries and the contribution of the co-operative model to community-based economic growth.

Linear Accelerator Laboratory

The Linear Accelerator Laboratory is a centre for basic research in the study of the atomic nucleus and smaller systems. This study involves high technology and the laboratory represents a pool of expertise in areas ranging from computers to welding and from electronics to the interaction of radiation with matter.

Toxicology Research Centre

Toxicology is a multidisciplinary science embodying many fields of the medical, life, and earth sciences. The Centre was established in 1983 to co-ordinate and support research efforts of the numerous working groups on campus active in Toxicology. The Centre is concerned with many aspects of the adverse effects of chemicals on living organisms and deals directly with questions concerning: effects of chemicals on human and animal populations; limits of safety for foods, food additives, drugs and household and industrial products; and evaluation of acute and long term adverse effects of chemicals in the environment. Studies conducted by the Centre have application to all regions of Canada. The Centre has an interest in all toxicological problems in Canada and is fully prepared to assist Northerners with the issues and projects that fall within the wide field of Toxicology.

Saskatchewan Fisheries Laboratory

The role of the Fisheries Laboratory is to undertake fisheries resource inventory, program evaluation, and other specialized fisheries studies pertaining to management needs.

Diefenbaker Centre

The Rt. Hon. John G. Diefenbaker Centre is both a museum and an archives containing memorabilia and the papers of Canada's thirteenth prime minister. In the summer of 1986 the Centre will be opening the papers pertaining to the prime ministerial years, which will be of particular interest to researchers of such issues as northern resource development and native/Inuit rights. As well, in the Diefenbaker gallery there is a small display dealing with these topics. The museum also has temporary displays planned for 86/87 on mining in the north and one on Pres. J.W.T. Spinks which has some related materials on radioactivity.

The Centre runs extensive education/extension programs for both students and the general public. All temporary exhibits have interpretive programs and there are various programs on our system of government using Diefenbaker materials as the starting point to an understanding of broader issues. The Centre staff could prepare and teach a seminar on the northern issues as they relate to Diefenbaker for university classes in such disciplines as history, political science, geography, commerce, etc.

Student services

Student Health Centre:

The Student Health Centre is staffed by professionals including physicians, psychiatrists, a psychologist, a social worker, and nurses. The Centre provides a wide range of general medical services, including contraception, immunization, counselling, and employment medicals.

Student Counselling Services:

The University of Saskatchewan provides counselling services to all students. Personal counselling is available for all personal concerns interfering with a student's academic or social development. On-going group counselling, counselling of mates, and career counselling are also available. A weekly program in study skills is available for development of skills necessary to succeed in college, such as note-taking, essay preparation, how to prepare for and write exams, time management, etc.

University Residences:

The University operates two Residence complexes, McEown Park and Voyageur Place. Voyageur Place provides for a room and board arrangement and is located on campus. McEown Park is apartment type accommodation and is located approximately five blocks south of the campus. There are one and two bedroom apartments for single students, couples and families, and six bedroom apartments for groups of six single students sharing. The 1985/86 rates are:

Voyageur Place, single $2858.00 for winter session double $2619.00/person for winter session

McEown Park, 1 bedroom apartment $281.00/month; 2 bedroom apartment $360.00/month; 6 bedroom apartment $1152.00/person for winter session.

Early application is recommended. For more detailed information and application forms write to the Residence Office, 128 Saskatchewan Hall, University of Saskatchewan, Saskatoon, Saskatchewan S7N 0W0, or call (306) 966-6775.

SIMON FRASER UNIVERSITY
BURNABY, B.C.

General information

Simon Fraser University
Burnaby, B.C. V5A 1S6
(604-291-3111)

Northern scholars

1) Koroscil, Paul M. The two courses Geography 262 and 462 each contain a section on the north, dealing with diffusion and migration, land tenure, urban ecology, the death of the North as a culture region and the future of the north. Specializations — historical geography, human geography.

2) Copes, Parzival. He has developed his northern interests and is head of the Institute of Fisheries Analysis with the Institute of Fisheries at the University of Tromsø in North Norway, resulting in visiting lectures and seminars, joint research and publication. He has also been very active in trying to bring Soviet Union colleagues into liaison and membership with various regional science organizations around the Pacific and on the North American continent. These organizations all involve important connections with northern matters. Interests — economic development, economics, political science, regional development.

3) **Yerbury, J. Colin.** He has directed the development of distance education by SFU for British Columbia, overlapping into Yukon and other regions. Some of these courses have a distinct northern relevance. He has also published research into the early history of northern regions. His article on Distance Education appears in the section of this volume devoted to that topic.

4) **Nance, Margit.** Margit has been the prime organizer within the Northern Conference, an educational and informational network arising from northern initiatives for those involved in the delivery of justice services to professional, paraprofessional and community interests within the Northwest Territories, Yukon and Alaska. She has been particularly concerned with the responsiveness of existing services to community needs, that is difficulties arising from cultural barriers to communication, particularly with regard to the apprehension experienced by young offenders within remote northern communities. Any meaningful participation of northern communities in the administration of delivering local justice programs must not involve "fly in — fly out" problems related specifically to legal language and difficulties associated particularly with juveniles. Among the organizations that have made use of expertise coming out of this group include the Labrador Institute of Northern Studies and the Centre for Northern Studies and Research at McGill University.

5) **Crampton, Colin B.** Colin has conducted research into various aspects of the physical landscape: landforms and soils, in combination with vegetation within the northern environment. Specifically, work has been undertaken across the Northwest Territories concerning cryoturbated soils, in the Mackenzie River valley about environmental impact and land sensitivity assessments, in Yukon relating to soils, permafrost and thaw penetration related to river migration, and in northern British Columbia regarding environmental impact assessments for pipeline construction. He teaches a course on northern social and physical interactions, mostly as a distance correspondence course, and on campus a geomorphology course, a third of which is directly concerned with northern periglacial environments. These courses are strongly influenced by many years during which a scientist has wandered amongst, and talked with people of the north, in their homes and within groups. This influence has lead to publications within the field of landscape, social and economic interactions. Specializations — Soils and soil science, permafrost, land use, physical geography; Yukon, Northwest Territories, Northern B.C.

6) **Gill, Alison M.** Her primary research and publishing activity is in the design and planning of northern resource communities, especially from a behavioral perspective. Current research is a planning evaluation study of Tumbler Ridge, the new coal mining town in northeast British Columbia, specifically an evaluation of innovative social and physical design features to ascertain if they are appropriate in the setting of an isolated resource town.

Graduate research is being undertaken within northern regions by the Departments of Archaeology, Communications, Criminology, Geography and Biological sciences.

Principal "northern" departments

Department of Archaeology

Location: Room 9635 — Multi-purpose Complex
Telephone: 291-3135
Chairman: Roy Carlson
Adviser: Ingrid N. Bell, Departmental Assistant
Room 9633A
291-4687

The Department offers courses leading to a Bachelor of Arts Degree. Students planning to major or take Honors in Archaeology are expected to obtain a multidisciplinary background by taking courses in a number of complementary disciplines and are urged to seek advice from the Department early in their university careers with regard to the structuring of their individual programs. PHYS 181-3, Introduction to Physical Science in Archaeology, is specifically recommended for Majors.

School of Criminology

Location: Room 7300 — Bennett Library
Telephone: 291-3213
Chairman: S.N. Verdun-Jones
Undergraduate
Program Director: C.T. Griffiths
Graduate
Program Director: J.W. Ekstedt
Research Director: R.R. Corrado
Adviser: Deborah Palliser
Room 7301 — Bennett Library
291-3527

Criminology offers courses leading to a Bachelor of Arts degree to students interested in a comprehensive, interdisciplinary approach to the subject matter of criminology.

The study of criminology attempts the unification of all aspects of crime by an interdisciplinary and integrative approach. The curriculum is designed to assist students to acquire an in-depth understanding of the complexities of criminal delinquent, and deviant behavior and of societal reaction to crime and deviance. Students concurrently acquire a theoretical and practical knowledge of the criminal justice system and its components, and gain insights into the philosophy, sociology, and present state of criminal law.

A wide range of disciplines (including Psychology, Sociology and Anthropology, Political Science, Business Administration, Economics, Philosophy, Computing Science, and Mathematics are integrated with Criminology courses into the curriculum.

Department of Geography

Location: Room 7123 — Classroom Complex
Telephone: 291-3321
Chairman: R. Hayter
Adviser: Ida Curtis
Room 7124 — Classroom Complex
291-4128

The Department of Geography offers a program of study within the Faculty of Science leading to the degree of

Bachelor of Science with a Major or Honors in Geography. The B.Sc. program in Geography emphasized the physical and natural science components of the discipline.

Department of Biological Sciences

Location:	Shrum Science Centre B8255
Telephone:	291-4475
Chairman:	L.M. Srivastava
Adviser:	Ms. Carole Thompson Shrum Science Cemtre B8257 291-3292

Programs are offered in Biological Sciences, Major, Honors, Minor; Environmental Toxicology, Minor, Extended Studies Diploma; Cooperative Education available to students in the Major and Honors programs.

UNIVERSITY OF TORONTO
TORONTO, ONTARIO

General information

University of Toronto, Toronto, Ontario M5S 1A1 (416-978-2011) has approximately 46,000 full-time undergraduates, 20,000 part-time and 6,000 graduate students. Its major faculties are: Arts and Sciences, Medicine, Dentistry, Engineering and Applied Sciences, Pharmacy, Nursing, Library Sciences, Law, Forestry, Architecture and Landscape Architecture, Education, Physical and Health Education, Music, Social Work, Theology, Management Studies. School of Graduate Studies. Department of Rehabilitation Medicine (Occupational and Physical Therapy). Institutes for Aerospace Studies, Environmental Studies, Medieval Studies.

The Arts and Sciences programme is taught at the Erindale and Scarborough campuses as well as at the main St. George campus located in downtown Toronto.

Organization of northern studies

Arctic and northern research and teaching are carried out in many departments of the University. A number of undergraduate courses specifically deal with the arctic, e.g. Arctic Studies in Geography and Arctic Ecosystems in Botany. The Botany and Zoology departments also collaborate with the Northern Studies Centre at Churchill, Manitoba to provide field classes in the arctic on Arctic Ecosystems and Arctic Ornithology.

The research activities are loosely co-ordinated through the Arctic and Northern Studies Working Group of the Institute for Environmental Studies located in the Haultain Building on the St. George campus. This group is presently co-ordinated by Professor Tom Hutchinson who is also cross-appointed to the Department of Botany (Phone numbers, (416) 978-4283 or 978-3532). The group consists of about 15 professors and 20-30 associated graduate students, with additional research technicians and post-doctoral fellows. Graduate applications are welcomed and can be directed to individual professors or to the Co-ordinator of the Working Group.

The group applies for and administers funds for arctic support from the Northern Scientific Training Programme of the Department of Indian and Northern Affairs.

The Graduate Co-ordinator's secretary at the Institute for Environmental Studies, Ms. Sian Evans, is responsible for initial enquiries and can be reached at (416) 978-4283. For enquiries about the arctic field courses, Professor Josef Svoboda (828-5368) at Erindale or Professor Bob Jefferies (978-3534) can provide information, while specifically for the Arctic Ornithology course, Professor Jim Rising (978-3482) is the person to contact.

The Institute has its own library and resource centre with a collection of northern and arctic works including journals. The Institute also has computer facilities and data retrieval systems. The Librarian is Judy Eichmanis (phone number (416) 978-7429). Graduate research at the Master's level is through the School of Graduate Studies at the University. The Institute for Environmental Studies offers a collaborative Master's programme with the departments of Anthropology, Botany, Geography, Geology, Political Science, Zoology and the Faculty of Forestry. At the undergraduate level, the arctic emphases are strongest in the Faculty of Arts and Sciences.

Northern research activities

The departments where major arctic research activities are taking place are Anthropology, Botany, Geology, Geography, Social Science, Zoology, Community Health, Civil Engineering and the Institute for Environmental Studies. Work is also co-ordinated through the Royal Ontario Museum.

Professor Josef Svoboda has maintained a field station at Alexandra Fjord on Ellesmere Island for the past 6-7 years with Dr. Bill Freedman of Dalhousie University and Dr. Claude Labine of University of Alberta. The studies concern the nature of the plant and animal associations in this arctic oasis and the relationship to micro-meteorology.

Another major activity is Professor Bill Irving's studies (Anthropology) on historical reconstructions of the ancient occupied camp sites at Old Crow, where large collections of mammal bones and human artefacts occur along the banks of the river.

This and other sites have been used by Professors Jim

Ritchie and Les Cwynar who have carried out the reconstructions of the history of climates and plant associations in the area. Jim Ritchie has worked extensively in the Yukon, the Northwest Territories, northern Manitoba and Saskatchewan in both boreal and tundra systems.

Professor Bob Jefferies has worked for about eight years on the functioning of the snow goose-salt marsh ecosystems at La Perouse Bay near Churchill and, together with Fred Cook at Queen's, has a major field group at this site each summer.

Professors Tom Hutchinson and Magda Havas work most years at the Smoking Hills, located on Cape Bathurst, Franklin Bay, studying the ecology and physiological adaptations of the burning cliffs which cause strongly acidic smoke to affect the local area.

Professor Tony Lewkowicz (Geography, Erindale) has been studying ice features for a number of years with a field party on Banks Island and in areas around Tuktoyaktuk.

Co-ordinated oil spill effects research has been carried out at Balaena Bay, Cape Parry, at Tuktoyaktuk and Norman Wells by botanists and zoologists and chemical engineers from the group. Studies involved Professors Tom Hutchinson, Johan Hellebust, Don Mackay and Malcolm Telford.

A graduate student, Martha Johnson, has worked for three summers at Povungnituk, studying the way the local Inuit classify and identify the birds, and how their knowledge and classification compare with the scientific zoological system.

A major ongoing project has been to try to develop economic and effective methods of raising crops in the Low and High arctic. Experimental greenhouses and plastic enclosures have been used using an igloo-like design. Potatoes, onions, cabbage, radish and lettuce have been successfully raised in the short growing season at Eskimo Point and even in northern Ellesmere Island. The project is a joint one of Drs. Josef Svoboda and Ray Cummins, with graduates Bonnie Bergsma and Mark Romer.

Studies have also been made of techniques for rapid long-term re-vegetation of arctic and sub-arctic mine tailings of a toxic chemical nature. These studies have involved work in both the Yukon and N.W.T. at eight different mine sites. The investigator was Tom Hutchinson.

Dr. Jim Rising and graduates are studying the taxonomy of the Iceland gull, Thayers gull, herring gull and Glaucous gull especially focussing on hybridization at colonies on the Home Bay area of eastern Baffin Island.

On Ellesmere Island, in addition to the botanical, mammal and ice studies, Dr. Schwerdtner of the Department of Geology has annual field parties working on various structural geological features. This has recently involved work at the Hare Fjord Diapir and adjacent faults in order to determine how this compares with other diapirs previously studied.

A study for the Department of Community Health has been carried out at Sioux Lookout in Northern Ontario. The present aspect is to determine the reasons for the prevalence of hypertension in native populations which has been increasing. Studies have shown a link to low potassium in one-third of individuals affected. A comparison is being made of 150 individuals in Fort Severn and Big Trout Lake. The study is co-ordinated by Dr. C.P. Shah and carried out by Dr. B. Reeder who has extensive experience with the local communities.

An additional 1986 study will investigate the preventative health care use of pap smears to detect risk of cervical carcinoma amongst native women.

Dr. Gary Heinke of the Department of Civil Engineering has been studying the efficiency and methodology of sewage treatment and disposal systems for arctic communities for a number of years, with programmes at Inuvik and Yellowknife.

About 25 professors are actively involved in ongoing Arctic and Northern Studies work. Most have graduate students and technicians involved. Perhaps 20 student theses per year involve direct northern research. In addition, an equal number of undergraduates are hired as summer assistants for northern field work. In 1985, the University of Toronto received graduate training awards from the DINA Northern Scientific Training Programme of $57,000 for 30 students, as well as very sizeable Northern Supplements for research from the Natural Sciences and Engineering Research Council, and logistic support from the Polar Continental Shelf Project of the Department of Energy, Mines and Resources. Each year a research workshop is held at the University on northern and arctic research. It was held in April 1986.

A number of native students have been involved in these studies, especially as undergraduate field associates.

Northern courses

Botany

Arctic Ecosystems Undergraduate field course for 2nd - 4th year students. Given at Churchill Northern Studies Centre each year for two weeks in July. Emphasis is on arctic tundra and boreal forest ecosystems and on salt marshes. Instructors are Josef Svoboda, and Bob Jefferies of the Department of Botany and Roger Hansell, Department of Zoology, plus staff from Churchill and the University of Manitoba.

Ecological Plant Geography and Palynology For upper level undergraduates. Origin and development of the vegetation of North America. Special emphasis is given to the history of tundra and boreal forest successions. Instructors: Jock McAndrews, Royal Ontario Museum and Department of Botany.

Arctic Plant Ecology Course on the diversity of plant life in arctic ecosystems and on the physiological adaptations they show to their environment. The role of grazers such as caribou and muskoxen are discussed. For 2nd and 3rd year undergraduates. Given at Erindale College. Instructor: Josef Svoboda.

Zoology

Arctic Ornithology A study of the birds, their behaviour and ecology at the Churchill Northern Studies Centre. For

2nd and 3rd year undergraduates. Instructor: Jim Rising and John Barlow, Department of Zoology and Royal Ontario Museum.

Anthropology

Archaeology of Eastern North America For 3rd and 4th year undergraduates. Chronology and analysis of the prehistoric culture areas and stages of eastern North America.

Early Man in North America The archaeology of the earliest populations in the New World, including discussions of Canadian native peoples and the Yukon Old Crow contribution to knowledge. Instructor: Bill Irving. 3rd year undergraduates.

Canadian Indian and Inuit Change Fourth year undergraduate. Contrasting interpretation of historical, social, economic and political factors peculiar to Canada. Contemporary change in Indian and Inuit communities — social, political and economic; government policy; national and regional Indian organizations, selected legal cases and land claims. Indian nationalism, aboriginal rights.

Geography

Arctic Environment and Resources Second year undergraduate. Climate, soils, ice, biogeography, glacial factors, permafrost, cultural and historical problems, past and current exploitation and development. Dr. Jopling, instructor.

Airphoto Interpretation Airphotos as tools in the study of rural landscapes. Studies of drainage patterns, natural vegetation and land use. 2nd year undergraduate.

Biogeography Analysis of past and present plant and animal distributions. Continental drift. Quaternary climatic changes and human interference on contemporary patterns. 3rd - 4th year undergraduate. Instructor: T. Davis.

Geology

Glacial and Periglacial Geology Elements of Glaciology, character and origin of glacial deposits and landforms, frozen ground phenomena in the periglacial environment, glacio-isostatic crustal movements, eustatic changes in sea level, glacial history of North America. Aerial photographic imagery. Given with Faculty of Applied Science and Engineering. 3rd year undergraduate course.

Petroleum Geology Application of geology to exploration for oil and gas. Origin and occurrence of petroleum in sedimentary basins. Accumulation of hydrocarbons in structural and stratigraphic traps. Cover, drill cuttings, logs and other subsurface data. 4th year undergraduate.

Credit transfer

Transfer credits are available for certain of the field courses. Each case, otherwise, has to be individually considered. There are no general guidelines.

Faculty involved in northern and especially arctic studies

R.F. Badgley	Behavioural Science	Fac. of Medicine	Ontario
C.S. Churcher	Zoology	Bone reconstructions	Yukon
W.G. Dean	Geography	Cartography	N. Canada
J. Gittins	Geology		
M.E. Charles	Chemical Engineering	Minerology	
W.R. Cummins	Botany	Plant physiology	N.W.T.
F.J.C. Griffiths	Political Science		
R.C. Gunn	Survey Science		
R.I.C. Hansell	Zoology	Small mammals	Churchill area
M. Havas	Environmental Studies	Limnology/pollution	Western arctic
G.W. Heinke	Civil Engineering		Western arctic
T.C. Hutchinson	Botany	Stress ecology	W. arctic/Yukon
W.N. Irving	Anthropology	Historical reconstructions	Yukon
R.L. Jefferies	Botany	Salt marsh ecology	Churchill area
I. Kalmar	Anthropology		
A.G. Lewkowicz	Geography	Ice features	Ellesmere/Banks
R. Ludvigsen	Geology		
D. Mackay	Chemical Engineering	Oil spills	Western and marine arctic
J.H. McAndrews	Royal Ont. Museum	Botany/Palynology	
K.J. Rea	Economics		
H.A. Regier	Zoology	Fisheries	Boreal
J.D. Rising	Zoology	Ornithology	Churchill
J.C. Ritchie	Botany		Yukon & N.W.T.
J.C. Rucklidge	Geology		N.W.T.
P.H. Russell	Political Science		
H. Savage	Anthropology	Archaeology	Yukon
W.M. Schwerdtner	Geology		N.W.T./Ellesmere
C.P. Shah	Community Medicine		
J.W. Smith	Chemical Engineering	Occupational Health	
J. Svoboda	Botany	Arctic agriculture & plant ecology	Ellesmere & N.W.T.
D.H. Turner	Anthropology		
J.A. Westgate	Geology	Paleontology	N.W.T.

TRENT UNIVERSITY
PETERBOROUGH, ONTARIO

General information

Trent University, P.O. Box 4800, Peterborough, Ontario, Canada, K9J 7B8 (705-748-1011) is an undergraduate liberal arts and science university organized around 5 residential colleges. It has a cluster of graduate programmes, viz., Watershed Ecosystems (Biology-Geography), Anthropology, Freshwater Sciences (including Physics and Chemistry), and Canadian Heritage and Development Studies (which includes Native Studies and Canadian Studies). Northern studies are involved in them all. Enrolment is: Full-time undergraduates, 3,125; Part-time undergraduates, 1,096; Full-time graduate students, 33; Part-time graduate students, 3.

There is essentially a single faculty, Arts and Science, with some 30 academic departments and programs.

Organization and development of Northern Studies

A small but dedicated group of faculty members with strong personal and professional interests in northern studies has given Trent University a very high profile in Canada in terms of its emphasis on northern and mid-northern studies, and has made their specialty a prominent focus of attention within the University. This interest is as old as the University itself. It was fostered in the 1960's by Trent's founding President, Thomas H.B. Symons, who is now the Vanier Professor at Trent. As new faculty joined the University, the commitment of many of them to northern studies broadened and intensified the University's role in this sphere. Collective efforts, even in the early days of the University, included the establishment of a committee to consider the proposal for a Mid-Canada Development Corridor, a mid-winter field trip to Labrador, and field trips (which have since become a tradition) to Northern Quebec and Labrador and to northern Ontario. In response to Professor Symons' report on Canadian Studies in Canadian universities (*To Know Ourselves*), Peter Adams, now Executive Director of A.C.U.N.S., went to considerable lengths to pursue his vision of a Northern Studies university.

Trent University has a *Northern Studies Committee*, whose primary, but not sole, function is to co-ordinate the University's application to the federal government for Northern Scientific Training Grants and to administer them within the University. For some years before being formally constituted in 1981 as a Presidential Advisory Committee, the Trent University Committee on Northern Studies met at irregular intervals to co-ordinate research activities, grant applications, teaching activities, and other matters pertaining to Northern Studies. The establishment of a committee was a natural, almost inevitable, outgrowth of the communication that had long taken place among various members of the faculty and others. It has enabled Trent's views to be expressed as a strong, collective voice where matters concerning the North are discussed. In addition to serving as a valuable forum for coordinating scholarly activity in this field within Trent University, the existence of the Committee has also provided assurance to external agencies granting financial support for Northern Studies at Trent University that the available funds are appropriately expended.

Among other things, the Committee has represented the interests of scholars at Trent to outside agencies. In this connection the Association of Canadian Universities for Northern Studies (ACUNS), which Trent University played a very active role in establishing, has been particularly important. The Trent group also served as the Local Arrangements Committee for the 1980 Annual Meeting of ACUNS, held at the University. Trent has been represented on the Council of ACUNS since 1977 by Professors Hodgins and Helleiner. Bruce Hodgins represented Trent at the spring Annual Conferences and Annual Meetings of ACUNS held at Churchill in 1977, at UQAC in Chicoutimi in 1978, at Memorial in St. John's in 1979, and at Trent in 1980. Peter Adams represented Trent at Calgary in 1981, at Montreal in 1982, and at more informal ACUNS meetings in various places before 1977. Fred Helleiner represented Trent at Regina in 1983, at Hull in 1984, and at Edmonton in 1985. The current chairman of the Committee is Prof. F.M. Helleiner, whose address and telephone number are as follows: Department of Geography, Trent University, P.O. Box 4800, Peterborough, Ontario, K9J 7B8; telephone 705-748-1426.

Partly as a result of the Northern Studies Committee, Trent University has, since 1984, had the *Leslie M. Frost Centre for Canadian Heritage and Development Studies*, one of whose foci is northern studies. Its current director is: Professor B.W. Hodgins, Environmental Centre, Trent University, P.O. Box 4800, Peterborough, Ontario, K9J 7B8; telephone 705-748-1555.

Northern courses and programs

As a measure of the extent and diversity of Trent's northern interests, there are undergraduate courses in Geography, History, Canadian Studies, Environmental and Resource Studies and Native Studies, as well as several graduate programmes, already noted, which are the focus of northern studies at Trent. Research in northern conservation and northern resource history, in northern archaeology, and in glaciology has been ongoing for many years. Conferences at Trent have included the Association of Canadian Universities for Northern Studies, the Eastern Snow Conference, the International Symposium on Snow and Ice Chemistry and the Atmosphere, and the Canadian Indian and Native Studies Association's annual meetings.

Trent University is about to embark on an ambitious cross-disciplinary ***M.A. programme in Canadian Heritage and Development***, with three distinct clusters of interest: Native Studies; Wilderness conservation and heritage interpretation; Regionalism.

Within each of these, but especially the first two, there is substantial scope for students to pursue an interest in northern studies. The first graduate students will be enrolled in the programme in the fall of 1986. At the same time, Trent has successfully negotiated a major grant to establish a *Chair of Northern Studies*, whose first occupant, Prof. Thomas Berger, was at Trent from February to April, 1986. His public lectures, to be published in book form and his participation in various classes served to enrich the northern dimension of Trent's undergraduate programme and to enhance Trent's image as a centre for northern specialization.

Northern Studies visitors and conferences

Over the years, many other persons with reputations for northern expertise have visited Trent University in one capacity or another. Four of them, Marie Tremaine, Trevor Lloyd, Thomas Berger, and F. Kenneth Hare, have been granted honorary Trent doctorates. Others have come by invitation to attend various functions or to deliver guest lectures. Among them was a former Minister of Indian Affairs and Northern Development, the Hon J. Hugh Faulkner. Other recent visitors have included R.M. Koerner and E.F. Roots (Polar Continental Shelf Project), Morris Zaslow (Arctic historian), Simon Ommanney (Glaciology Division, Environment Canada), Richard Bill (discussing national parks in Labrador), P. Campbell Mackie (former ACUNS Executive Director), Peter Usher (Northern Research consultant especially active with the Inuit Tapirisat), Valerie Hume (DIAND), Eric Muller (producer of the Atlas of Northern Ontario), Bob Williamson (University of Saskatchewan, Saskatoon), Louis-Jacques Dorais (Inuit expert from Laval), John Livingston (Environmentalist and Northern author from York), Terence Armstrong (Scott Polar Research Institute), Douglas Pimlott (University of Toronto), Harald Finkler (DIAND), Chief Billy Diamond (James Bay Indians), Frank Duerden (Applied Geography, Ryerson), Michel Denis (dog sledder), William Barr (authority on Polar Exploration, University of Saskatchewan), Francois Bregha (Environment Canada), and Rick Riewe (Land Identification Coordinator, Nunavut Land Claims Project).

Many other northern specialists have come to Trent to attend one or more of a number of conferences that have taken place under the sponsorship of Trent University. Recent examples include:

- — ACUNS, Annual Conference, April 1980 (Third Annual Conference "Report", 1980).
- — Northern Frontier/Northern Homeland Symposium (with speakers from the Mackenzie Valley and Northern Ontario).
- — Seminar on Science and Training in the North, 1979.
- — Eastern Snow Conference, 1980 (Proceedings of the E.S.C., Vol. 37, 1980, 224 pp.)
- — International Symposium on Snow and Ice Chemistry and the Atmosphere (Annals of Glaciology, Vol. 7, 1984, 215 pp.)
- — Canadian Indian/Native Studies Association conference, 1985. (Proceedings to be published).

Study and research in the North

Trent has made extensive use of facilities provided by other institutions for its northern studies. Since 1970, groups and individuals from Trent have used the McGill Subarctic Research Station at Schefferville as a base for various research and teaching endeavours. Several students have taken courses and/or pursued research at the Churchill Northern Studies Centre, at the federal research station in Iqaluit (Frobisher Bay), at the research facilities at Inuvik, and at the McGill field station on Axel Heiberg Island.

Northern Studies resources

Mention must also be made of various resources pertaining to the North which are available in the Bata Library at Trent. Special holdings include:

1. the famous George Douglas Collection;
2. the background documentation for the Symons Report, *To Know Ourselves*;
3. the full documentation of the hearings of Mr. Justice Berger's Mackenzie Pipeline Inquiry;
4. Federal Cultural Policy Review: background and working papers including briefs and supporting documents pertaining to its northern inquiry (chaired by T.H.B. Symons);
5. the Professor Jameson Bond Collection (books in Bata Library, documents at Peter Robinson College Library);
6. the recently acquired papers, maps, and indexed personal library of Professor Trevor Lloyd;
7. the Robert L. Hunter Collection of Canadiana, which contains, *inter alia*, key books and documents in the following areas: the impact of the fur trade on the exploration of routes to the Arctic and Pacific Oceans; the events that brought about the merger of the North West Company with the Hudson's Bay Company in 1820; the transfer of Hudson's Bay Company lands to Canada, the books and pamphlets in these and other categories are supported by an outstanding collection of maps, many of which are rare specimens, they document the history of Canada from 1556 to the present century.
8. the complete file of paper or fiche clippings compiled by the Canadian Association in support of Native Peoples.

Furthermore, the Trent Archives contain a considerable variety of items on northern topics. They include the complete archives of the Ontario and the Canadian Camping Association and the National and Provincial Parks Association of Canada (soon to be renamed the Canadian Parks and Wilderness Society).

Selected northern courses

In 1979, the ACUNS in its *List of Northern Courses at Canadian Universities* identified eight such undergraduate courses at Trent:

- — Canadian Studies-Geography 361: Geography of Canada

- Canadian Studies-History 422: Canada: The North
- Environmental and Resource Science 340: Northern Development: a case study in environmental impact assessment
- Geography 342b: Hydrometeorology: Snow and Ice
- Geography 364a: Geography of the Arctic
- Native Studies 200: Politics and Native Peoples
- Geography 395: Reading Course (may include North)
- Geography 400: Dissertation (may include North)

Since then others have been added. Furthermore, many other Trent courses deal significantly with the North, including Canadian Studies-Environmental & Resource Studies 200 (Canada, the Land). Of the eight courses, four are almost exclusively Northern:

1. *History-Canadian Studies 422: Canada: The North.* The historical and contemporary Canadian North in both its provincial and territorial contexts. Emphasis is intellectual and social. Given by Bruce Hodgins.
2. *Environmental & Resource Science 340: Northern resource development: a case study in environmental impact assessment.* An interdisciplinary study of the biological, geotechnical, social, economic and political aspects of northern mining, oil exporation, pipelines, LNG tankers, etc. and their relationship to the environment. Given by Robert Page.
3. *Geography 364: Geography of the Arctic.* Study of selected aspects of the Arctic with considerable reference to northern Canada but with the deliberate intention of developing comparisons between it and other parts of the north polar regions. Given by Peter Adams and others.
4. *Geography 342b: Hydrometeorology: Snow and Ice.* Study of geographical aspects of ice with particular reference to its role in hydrometeorological processes. Treatment of falling snow, snowcover, lake ice, glacier ice. Given by Peter Adams.

   A fifth course has been offered from time to time.
5. *Native Studies 481: Selected topics on aboriginal people of the Arctic.* This course examines the political, social, economic, and cultural development of the Arctic people of Alaska, Canada, Greenland, Norway, and Siberia. Each group is studied separately and attention focusses on issues relating to its status as a distinctive cultural and racial minority.

Various other courses in Anthropology, Canadian Studies, Environmental and Resource Studies, Geography, History, and Native Studies also have a substantial northern content, including annual field trips in three courses to the North. Professor Shelagh Grant is giving six guest lectures this year, which are all on northern topics:

- Canadian Studies 200 — Sovereignty and the North;
- Native Studies 100 — two lectures on the Inuit;
- Canadian Studies 300 — Communities in the Arctic and Sub-arctic;
- History 100 — The Yukon Gold Rush;
- Canadian Studies 422 — the North and World War II.

Student activity in Northern Studies

Graduate students in Northern Studies at Trent in History, Geography, Biology and Anthropology have studied in the High Arctic, Labrador, the Yukon, Baffin Island, the Mackenzie Valley, and Northern Ontario. Many have been assisted by Northern Scientific Training Grants. Two of these students held S.S.H.R.C. Special M.A. awards, two (including one undergraduate) have held the prestigious Studentships in Northern Studies, awarded by the Canadian Northern Studies Trust, and several held NSERC Scholarships. One of these students participated in the 1980 Yellowknife Symposium on "Centenary of the Arctic Islands in Canada" and has published an article on the "Canol Project" and several others on northern-related topics. Her book on transitions in northern policy to the 1950's is in the process of publication. A number of other students, in the Watershed Ecosystems Programme, have worked, or are working, on ice, including snow, topics. Trent does not have its own Ph.D. programme, but several Trent students already have doctorates based on studies in the north.

The Northern Scientific Training Program administered by DIAND has been particularly important to Trent University students, at both the graduate and the senior undergraduate levels. On average, over ten students per year have been supported in this way in recent years.

At least seven present or former undergraduate students have obtained Royal Canadian Geographical Society research grants which enabled them to do field work on Baffin Island, on the Nahanni River, and in the Yukon. Others have been funded to do research in Iceland.

This emphasis on Northern Studies is remarkable, given the small scale of graduate studies at Trent. A similar point could be made with respect to the undergraduate programme. For example, more than one-third of the participants in one recent third-year course involving Northern issues have gone on to be active in Northern research or Northern service.

Significant numbers (a hundred or more *each* year) of Trent University undergraduate students have been exposed to Northern Canada directly through participation in Trent University field courses in the North (including four major undergraduate and graduate field trips to Elizabeth Lake, Labrador, a Canadian Exploration Group expedition to Astray Lake, Labrador, and trips at least twice a year to Northern Ontario) or through University of Windsor field courses in the North and courses at the Churchill Northern Studies Centre. An annual trip to Temagami, since 1973, has included guests (both students and faculty) from l'Université de Sherbrooke, Mount Allison University, St. Lawrence University, Freiburg University, York University, Ryerson University, and elsewhere. Much larger numbers have studied the North indirectly by taking one or more of the eight courses listed in 1979 as Northern Studies Courses at Trent by the ACUNS. In most of the last 15 years, the Eastern Snow Conference Student Prize has been won by Trent University students

Probably a disproportionately large number of Trent alumni who have had this exposure have gone on to post-graduate studies or resident employment in the North (at, for example, Schefferville, Fort Simpson, Whitehorse, Northwestern Ontario, Resolute Bay, Hay River, Inuvik, Arctic Bay, Hall Beach, Yellowknife, the Slave Delta, Baker Lake, the Beaufort Sea). Another is engaged in doctoral study involving the Antarctic at the Scott Polar Research Institute of the University of Cambridge. Another is doing doctoral work at Uppsala University in Sweden. Yet another was a researcher for Ontario's Royal Commission on the Northern Environment and was subsequently employed by the Conservation Council of Ontario to research and write, under Professor Hodgins' supervision, a major position paper on the Ontario environment "North of 50°" (*A Submission to the Royal Commission on the Northern Environment*, Toronto, 1980). Yet another was employed in 1981 by the National and Provincial Parks Association of Canada to research wilderness areas in Northern Ontario and to edit a special theme issue of *Park News* on the Slave River.

Four persons from Trent attended the Arctic Islands Symposium in Yellowknife in August 1980, at which Prof. Symons gave the closing address. In 1982, one faculty member, one graduate student, and one undergraduate student attended the 40th Anniversary Seminar on the Alaska Highway in Fort St. John, Northern British Columbia. In 1985, Trent was represented by three faculty and several students and alumni at the A.C.U.N.S. Arctic Heritage Symposium in Banff, and by three faculty (including the President of the University) and several alumni at the Arctic Policy Conference in Montreal, sponsored by the Inuit Circumpolar Conference.

Trent Faculty have also been involved in public affairs in the North. R.F.D. Page was historical consultant to the Dene Nation for the Berger Inquiry into the Mackenzie Valley Pipeline. Bruce Hodgins has been Chairman and is now Secretary of the Northern Studies Group of the Canadian Historical Association. Fred Helleiner is Chairman of the Northern Subcommittee of the Technical Advisory Committee for the Breeding Bird Atlas of Ontario.

Distance Education

Trent University is philosophically committed to a form of education which stresses frequent and direct personal communication. As a result, we have not developed "distance education" programmes.

Transfer of credit and cooperative education

For admission to a degree programme at Trent, we take into consideration maturity, motivation, background, work experience, and a number of other factors. Persons holding two-year college diplomas *in appropriate programmes* and with acceptable standing can transfer up to three credits to Trent. Persons holding three-year college diplomas *in appropriate programmes* and with acceptable standing can transfer up to five credits. Trent recognizes university credits obtained at the Churchill Northern Studies Centre. There is at present a northern resident who is taking an M.Sc. programme on a part-time basis.

The two-year Native Studies Diploma Programme is designed for individuals who lack the normal entry qualifications for a degree programme but have the equivalent of Ontario Grade XII standing or the qualifications for admission as a mature student. Students in this programme take six undergraduate courses, including three in Native Studies, and two Communications courses. Upon successful completion of the Diploma requirements, students may transfer their university courses to a degree programme. Inquiries should be sent to the Chairman of the Native Studies Programme, and applications must be received by the University by June 30. Two other Diploma programmes in Native Studies also exist (see below).

A concurrent teacher education programme involves placement for practice teaching in local schools. Graduates of this programme are now teaching in the North.

Northern research

See above references to conferences at Trent and the DIAND Northern Scientific Training Program.

Significant contributions to the literature on the North have been produced at Trent. Four periodicals with special northern sections or frequent northern coverage are or have been edited and published at Trent (*Journal of Canadian Studies*, *Alternatives*, *Park News*, *Birchback Alliance*). The 1980 edition of the *Trent Student Geographer* (No. 8) was devoted to *Studies in Snow and Ice*, and included a note on "Glaciological Research at Trent University", which listed a bibliography of almost one hundred entries. An earlier report (1970) of research conducted at Schefferville and Churchill Falls by Trent students on a field trip to the area was given wide circulation, including a copy to the Prime Minister of Canada immediately prior to his visit to Schefferville. Individual publications by various Trent faculty are far too numerous to list here, but include studies in historiography, political evolution, glaciology, archaeology, biology, resource management, and many others.

Northern Studies scholars

- Peter Adams, Geography, Glaciology, Arctic in general, Nouveau Québec, Labrador, Axel Heiberg Island, Fort Simpson.
- Roy T. Bowles, Sociology, Community Studies, Northern British Columbia.
- James M. Buttle, Geography, Hydrology, Northern Canada.
- J. Graham Cogley, Geography, Plate Tectonics, Arctic in general.
- Shelagh Grant, Canadian Studies, History, Political

and Social History of the far North, Yukon and Northwest Territories.

— Frederick M. Helleiner, Geography, Tourism, Ornithology, Northern Ontario.
— Bruce W. Hodgins, History, Biography, Northern Aboriginal Peoples, Northern Ontario
— David C. Lasenby, Biology, Limnology, Cornwallis Island
— R. Alexander Lockhart, Sociology, Community Studies, Northern British Columbia
— John S. Marsh, Geography, Parks and Tourism, Yukon, Northwest Territories
— Donald N. McCaskill, Native Studies, Acculturation, Canada in general
— Robert J.D. Page, History and Environmental Resource Studies, Economic Development and Land Claims, Yukon and Northwest Territories
— Thomas H.B. Symons, Vanier Professor, Cultural Studies, Northern Canada
— Morgan J. Tamplin, Anthropology, Archaeology, Baffin Island
— Joan M. Vastokas, Anthropology, Social/Cultural Studies, Northern British Columbia
— Romas K. Vastokas, Anthropology, Archaeology, Labrador
— John H. Wadland, Canadian Studies, Biography, Northern Canada

Selected northern publications

Adams, W.P., 1986. Northern Limnological Processes: research and management. Proceedings Arctic Heritage Symposium, Banff (in press).

________ (ed.) 1985. Snow and Ice Chemistry and the Atmosphere, Annals of Glaciology, vol. 7, 215 pp.

________ 1985. The McGill Station on Axel Heiberg Island, NWT. Polar Record, pp. 431-433.

________ and D.C. Lasenby 1985. The roles of snow, lake ice and lake water in the distribution of major ions in the cover of a lake. Annals of Glaciology, 7, 202-207.

________ 1984. Lake cover research in Northern Quebec and Labrador, McGill Subarctic Research Paper, 39, pp. 109-124.

________ and N.T. Roulet, 1984. Sampling snow and ice on lakes. Arctic, 37(3), pp. 270-275.

Hodgins, Bruce W. and Hobbs, Margaret (eds.), 1985. Nastawgan: The Canadian North by Canoe & Snowshoe. Toronto: Betelgeuse Books.

Marsh, J.S., 1985. "Conservation, Tourism and Development: Case Studies in Northern Canada." In: Duerden, F. (ed.), Applied Research in the Canadian North. Toronto: Ryerson, pp. 77-104.

Page, Robert J.D., 1986. Northern Development: The Canadian Dilemma. Toronto: McClelland & Stewart.

Symons, T.H.B., 1976. To Know Ourselves, AUCC, Ottawa, 2 vols, 370 p.

Native Studies

Trent University has an extensive Native Studies Degree, undergraduate and graduate, programme offering 30 courses in areas such as Native languages and culture, history, contemporary issues in politics, law, education, social services and community development and applied courses with opportunities for field placements.

The Department offers two Diploma Programmes: one in general Native Studies and one in Native Management and Economic Development. These programmes are aimed at Native people who do not possess the normal admission requirements. They are characterized by courses in academic skill development and extensive student support services.

A newly introduced Native Management and Economic Development Programme (co-offered with Administration and Policy Studies) is designed to train Native people to assume management positions in Native organizations or communities or engage in economic development activities.

A Metis programme in community-based research has also been established.

A number of faculty who have carried out research in the North are associated with the Native Studies Department.

Those wishing further information should contact Chairman, Department of Native Studies, Trent University, Peterborough, Ont. K9J 7B8 (705-748-1310).

UNIVERSITY OF WATERLOO
WATERLOO, ONTARIO

General information

The University of Waterloo, Waterloo, Ontario, Canada N2L 3G1 (519-885-1211) began its teaching and research programs in July, 1957. The number of students has grown markedly to present enrollments of: 14,500 full-time undergraduates, 6,600 part-time undergraduates, 1,300 full-time graduate students, and 450 part-time graduate students.

The University of Waterloo (UW) offers programs in the Faculties of Arts, Engineering, Environmental Studies, Human Kinetics and Leisure Studies, Integrated Studies, Mathematics, and Science. Associated with the university are four church-affiliated colleges, including Conrad Grebel College, Renison College, St. Jerome's College and St. Paul's College. The University has almost 60 academic departments and programs.

An important feature of many undergraduate programs at the University of Waterloo is the "Co-op" system consisting of alternating study and work terms. These programs place students in career-related work situations during their undergraduate days, providing experience and the opportunity to apply their knowledge in occupational settings. Correspondence course programs using audio-visual teaching techniques are another important aspect of the UW curriculum.

Northern Studies

The organizational focus for northern studies at UW is the *President's Committee on Northern Studies (PCNS).* The committee is composed of faculty representatives from those Faculties and Departments with teaching and research interests in the North. The Chairman at present is Prof. Robert F. Keith, Department of Man - Environment Studies, University of Waterloo, Waterloo, Ont. N2L 3G1 (519-885-1211, ext. 2574).

The principal work of the PCNS is to facilitate student research in the North, to host a lecture series on northern topics and to publish working papers based on student and faculty research. The PCNS serves also, as a forum for discussion within the UW community of northern research and training. The committee administers the Northern Scientific Training Program grants from the Department of Indian Affairs and Northern Development to the University of Waterloo. The committee has also received annual grants from the UW Academic Development Fund to support the above-mentioned activities.

The PCNS was organized in 1977 and provides both an academic and administrative focus for northern research and teaching. The PCNS is composed of faculty members from Anthropology, Biology, Civil Engineering, Earth Sciences, Environmental Studies, Geography, Political Science, Recreation and Leisure Studies, and Urban and Regional Planning. The principal areas of northern teaching and research at UW are Biology, Civil Engineering, Environmental Studies, Geography and Regional Planning. Prominent among past research activities, have been:

- Salmon and Arctic Char research in Northern Quebec
- Large Mammal Research (e.g. caribou) in the Yukon and Northwest Territories and Labrador/Quebec
- Environmentally Significant Area Planning and Management in the Yukon and Northwest Territories
- Coastal Zone Management in the Arctic
- Conservation Lands Policy, Planning and Management
- Analysis of Environmental Impact Assessment Processes
- Evaluations of Land Use Planning and Management
- Road and Airstrip Construction Techniques in Permafrost Conditions
- Building Construction Techniques in Arctic Environments
- Non-Renewable Resource Policy Analysis
- Northern Parks Management
- Northern Sea Ice Mechanics and Mapping

Northern publications

The PCNS publishes "working papers" based upon the research of students and faculty. When appropriate, students are encouraged to prepare technical documents, which often include extensive data, based on their northern research. These are working documents and may be of interest to planners and managers as well as to other researchers.

In addition, the PCNS is publishing a special collection entitled, "The Yukon Environmentally Significant Areas Series". These working documents are based upon several years of research in the Yukon and include detailed data on the areas' abiotic, biotic, cultural and institutional characteristics. The series includes the following reports:

1. J.B. Theberge, M. Fitzsimmons, and M. Stabb. Kluane North Resource Survey: Biotic Aspects.
2. D. Sauchyn. Aishihik Lake Resource Survey: Abiotic Aspects.
3. J.D. Bastedo and J.B. Theberge. Aishihik Lake Resource Survey: Biotic Aspects.
4. B. Hans-Bastedo. Aishihik Lake Resource Survey: Cultural Aspects.
5. J.G. Nelson and J.B. Theberge. Aishihik Lake Resource Survey: Institutional Aspects.
6. M. Sauchyn. Aishihik Lake Resource Survey: Grasslands Study.
7. D. Sauchyn. Keele Peak Resource Survey: Abiotic Aspects.
8. J.B. Theberge, M. Fitzsimmons, and M. Stabb. Keele Peak Resource Survey: Biotic Aspects.
9. K. O'Reilly. Keele Peak Resource Survey: Cultural Aspects.
10. J.G. Nelson, and J.B. Theberge. Keele Peak Resource Survey: Institutional Aspects.
11. J.D. Bastedo. Bennett Lake, Carcross Dunes, Tagish Lake Resource Survey: Biotic Aspects.

Some reports will be available in Spring 1986. It is anticipated that all reports will be available in December 1986. For further information write to:

Professor Robert F. Keith,
Chairman,
President's Committee on Northern Studies,
Dept. of Man-Environment Studies,
University of Waterloo,
Waterloo, Ontario, Canada,
N2L 3G1.

Northern courses

While the University of Waterloo does not offer a program of northern studies, there are several courses, both graduate and undergraduate that are either partly or wholly concerned with northern content. What follows is a representative listing of courses with brief explanatory notes.

Anthropology

Anth 233	Inuit and Eskimo Culture An examination of Inuit and Eskimo cultures of Alaska, Canada, and Greenland. Administrative systems will be analysed and compared, as will the contemporary problems their communities face.
Anth 241	The Contemporary Canadian Indian Scene This course focusses upon contemporary issues facing the Indian community. Examples include Northern Indian situations.

Anth 330	Cultural Ecology An examination of the relationships among environment, technology, society and culture including northern case studies.
Anth 351	Comparative Policies on Native Minorities Survey of government policies with emphasis on attempts to involve native groups in policy-making.

Some other anthropology courses include northern content used to illustrate various concepts.

Biology

UW offers several courses in which northern information forms a significant part of the overall course. Included are:

Biol 250	Ecology The nature of ecosystems, energetics, biogeochemical cycling and population biology. Reference is made to northern ecosystems.
Biol 420	Flora of Canada Major plant communities of Canada, including the north, and their ecology, conservation and endangered species.
Biol 451	Limnology Geomorphology, physical and chemical processes and biology of lakes and streams. Emphasis on zooplankton, zoobenthos and fish.
Biol 452	Fisheries Biology The practices of fisheries biology; life cycles, production, harvest and management. Northern Fisheries discussed in the course.
Biol 456	Population Ecology Analysis of structure and dynamics of plant and animal populations. Northern plant and animal populations are examined.

Canadian Studies

Cdn St 301	Regionalism: North Socio-economic, environmental and political perspectives on northern development.

Civil Engineering

Civ E 493	Engineering in the Canadian North Discussion of technical, economic, social and other problems associated with carrying out engineering planning, design, construction and operations in the Canadian North.

Earth Sciences

Some courses in Earth Sciences have northern content. The following courses are examples.

Earth 370	Economic Geology Occurrence of metallic and non-metallic minerals, construction materials and energy. Special emphasis on resource industries.
Earth 433	Applied Sedimentology Source, migration and sedimentary environment of hydrocarbons.
Earth 440	Quaternary Geology Quaternary period study with emphasis on glaciation.

Environmental Studies

Several courses in the Faculty of Environmental Studies (Departments of Geography (Geog), Man-Environment Studies (M Env), and the School of Urban and Regional Planning (Plan)) deal with northern interests. Some courses include brief case study analyses while others are almost wholly devoted to northern matters.

Env S 200	Field Ecology Concepts and principles of ecology; impacts of human activities. Various ecosystems studied including those in the North.
Env S 201	Introduction to Environmental and Planning Law Portions of this course deal with federal statutes and regulations that apply in the North.
Env S 417/ 418	Land Use History and Landscape Change Theory and method relating human activities to ecosystems. Northern case studies included.
M Env 241	Introduction to Environmental and Social Impact Assessment Approaches to evaluating impacts of human activities on ecological and social systems. Special emphasis is given to federal environmental assessment process. Northern cases used extensively.
Geog/Plan 357	Conservation and Resource Management History of conservation, ecological principles of conservation and resource management. Northern case studies used.
Geog/Plan 662 (Grad level)	Natural Resource Policy Includes northern resources, world conservation strategy in the North, coastal planning in the North, northern political and economic systems and northern environmentally significant areas.
Geog/Plan 666 (Grad level)	Park and Wildland Planning Management Ecological, cultural and institutional aspects of parks and wildlands. Yukon and Northwest Territories cases are studied.

Political Science

P Sci 435/ 632	The Politics of Canadian Resource Development

	The course focusses on the actions of governments which have promoted the rapid exploitation of natural resources. Attention is given to the consequences for political and economic sovereignty and cultural and environmental impacts. Northern resource developments are examined.
	Recreation
Rec 325	Marine Parks and Recreation An analysis of marine park policy and management. Significant portion of the course devoted to northern marine areas.
Rec 327	Wildlands Recreation Planning A study of Canadian Wildlands with respect to recreation planning and management. Northern wilderness areas used as case studies.
Rec 435	Recreation Resource Policy A study of policies, policy development and policy gaps related to recreation resources in Canada. Northern areas form a portion of the course.

Distance Education

The University of Waterloo has made *degree-credit distance-education* a very significant part of its overall program. With 6,000 students, over fifty different subject areas, 300 courses and 20,000 course enrollments, it is the largest and most comprehensive program of its kind in Canada. In the Fall Term 1985, approximately 70 students from the Northwest and Yukon Territories were taking UW correspondence courses. The correspondence courses are very similar to on-campus courses. Each student receives a complete learning package consisting of lectures on audio tape cassettes, notes, diagrams, charts and equations, slides, etc., as appropriate. Assignments are returned to students with comments. End-of-term examinations are required and are administered through established centres convenient for the student. Degrees available from UW by correspondence include:

Arts	General non-major B.A. (Bachelor of Arts) General B.A. with a major in • Classical Civilization • Economics • English • Geography • History • Philosophy • Psychology • Social Development Studies
Environmental Studies	General B.E.S. (Bachelor of Environmental Studies) in Geography
Mathematics	B. Math (Bachelor of Mathematics) Pass Degree
Science	General Science non-major B.Sc. (Bachelor of Science) Degree

Cooperative education programs

The University of Waterloo introduced cooperative education to Canada in 1957 when it commenced its teaching programs. Now more than 8,500 students participate in over 40 undergraduate cooperative programs in all six faculties.

Co-op education requires students to alternate four month academic terms with four month work terms in career-related fields. Up to two years practical, "on the job" experience is gained by students in co-op programs. More than 1,700 employers from industry, business, the professions, social services and governments hire UW co-op students.

Transfer credit arrangements

From time-to-time students apply for admission to UW having been enrolled in other college or university programs. In such cases transfer credits can be considered. Each individual student's case is considered on its own merits. The transfer credits must be relevant to the UW program, must be at a satisfactory academic level and the student must have achieved very good standing in the courses. In some cases when transferring into a co-op program, previous work experience may be considered in relation to work term requirements.

Northern research

A number of key research projects have evolved over the years at UW. These include:

1. Char and Salmon Research
   A continuing program of studies on Arctic Char and Atlantic Salmon with implications for management of the fisheries has been underway in Northern Quebec for several years. Some of the work has consisted of joint undertakings with Makivik Corporation and the Department of Fisheries and Oceans. Support has also come from the Donner Foundation and from the Natural Sciences and Engineering Research Council. Funding for this project has exceeded $100,000 annually (Prof. G. Power and others).

2. Caribou Research
   Caribou research in the Yukon (Kluane Region) and Labrador has been ongoing for some time. Basic population distribution and movement data has been collected. Predator relationships have been investigated. Attention has also focussed upon the impacts of development activities on caribou. Annual funding has been in the $15,000 - $25,000 range (Prof. J.B. Theberge).

3. Yukon and NWT Environmentally Significant Areas
   In 1978, a program aimed at identifying, inventorying and delineating environmentally significant areas within the Yukon was begun. Based upon existing environmental data, thirty-five areas were identified. Selected areas were then examined in detail. New resource inventorying techniques were developed to include abiotic, biotic and cultural factors. In addition, institutional arrangements and boundary delineation procedures were developed. The areas of

detailed examination were:
1. Aishihik Lake Region
2. Keele Peak Region
3. Kluane North (Game Sanctuary) Region
4. Carcross, Bennett Lake Region
5. Francis Lake Region

Eleven technical reports are presently in press with publication of all eleven expected in 1986 (Profs. J.B. Theberge and J.G. Nelson). Annual funding was approximately $40,000 over six years.

4. Sea Ice Research

   Several projects on computer modelling of ice systems have been undertaken in recent years. Some projects focussed on ice movement and climatic and oceanographic characteristics. Other projects related ice systems to ship transport. Still other projects have related actual field data to radar and remote sensed data systems. Annual support for this research has approximated $50,000 (Profs. J.F. Sykes, W.C. Lennox, D.E. Grierson).

5. Various Research Projects

   In addition to the foregoing sets of studies, several individual projects have been conducted. Examples include:

Topic	*Approximate Annual Funding*
Road, Airstrip, Building Construction in Permafrost	$15,000.00
Landsat Imagery and Terrain Analysis	20,000.00
Renewable Resource Management: A Co-operative Approach	15,000.00
Socio-economic Program Evaluations on Petroleum Development	15,000.00
Wilderness Parks and Visitor Services Analysis	20,000.00
Coastal Zone Management in the Beaufort Sea Region	30,000.00
Environmental Surveillance: Norman Wells Pipeline	7,000.00
Conservation, Wilderness Lands and Institutional Arrangements	10,000.00

Northern Organizations have made significant contributions to the success of UW's research. The cooperation, assistance and support of native organizations, communities, local governments, industry and business, territorial governments and federal agencies have been instrumental in the success which the projects have achieved.

Northern scholars

Name	*Department*	*Specialization*	*Northern Regions*
Barton, D.	Biology	B14	N. Quebec
Carter, J.	Biology	B14	N. Quebec
Downey, T.	Political Science	H19	N.W.T. Yukon
Duthie, H.C.	Biology	B14	Labrador
Gibson, R.B.	Man-Environment Studies	H2	N.W.T. Yukon Labrador
Graham, R.	Recreation & Leisure Studies	H26 Park Planning	N.W.T.
Grierson, D.E.	Civil Engineering	D4	N.W.T.
Haas, R.	Civil Engineering	D4	N.W.T. Yukon
Keith, R.F.	Man-Environment Studies	H2	N.W.T. Yukon
Le Drew, E.	Geography	F8	N.W.T. Yukon
Lennox, W.C.	Civil Engineering	D4	N.W.T.
Michalenko, G.	Man-Environment	B8	N. Ontario
Morgan, A.	Earth Sciences	C10	N.W.T. Yukon
Nelson, J.G.	Geography	F7	N.W.T. Yukon
Power, G.	Biology	B14	N. Quebec
Smith, S.	Biology	B9	Yukon
Suffling, R.	Urban & Regional Planning	B20	N. Ontario
Sykes, J.E.	Civil Engineering	D4	N.W.T.
Theberge, J.B.	Urban & Regional Planning	B21	Yukon N.W.T. Labrador

Name	*Department*	*Specialization*	*Northern Regions*
Wall, G.	Geography	F6	Yukon N.W.T.
Weaver, S.	Anthropology	H15	N.W.T. Yukon

The specialization codes are those used in ACUNS' List of Northern Specialists at Canadian Universities/Liste des spécialistes du Nord dans les universités canadiennes, 2nd edition, 1983. Occasional Publication No. 8.

Northern Scientific Training Program

The University of Waterloo has participated in this program since 1977. Annual funding has risen from approximately $5,000.00 at that time to the present level of $40,000.00. Last year, fourteen students were supported in their research in the Yukon, N.W.T., Northern Quebec and Labrador. The disciplines represented were, biology, geography, environmental planning and management, recreation and civil engineering.

Recent northern conferences

ACUNS Annual Meeting 1986: Northern Education

In the winter of 1985 a committee of ACUNS chaired by J.G. Nelson began discussion in Yellowknife on Northerners' views on their own educational interests and needs. The purpose of these discussions was to establish a dialogue between northerners and Canada's universities and to develop the program for ACUNS 1986 Annual Meeting in Yellowknife. A steering committee was formed to develop the agenda for the conference.

Arctic Heritage Symposium
In August 1985, J.G. Nelson organized the Arctic Heritage Symposium, held in Banff, Alberta under the auspices of ACUNS. The conference brought together scholars and practitioners from many countries to exchange information about Arctic ecosystems and natural heritage areas.

CARC's National Symposium on Northern Issues
In 1986, R.F. Keith is assisting the Canadian Arctic Resources Committee with the planning of its National Symposium on Northern Issues. Six seminars will be held over a 9 month period focussing upon key issues including, native land claims, community decision-making powers, public infrastructure for local economic development, Arctic sovereignty, native development corporations and the commercialization of wildlife harvests.

UNIVERSITY OF WESTERN ONTARIO
LONDON, ONTARIO

General Information

The University of Western Ontario, London, Ontario, N6A 3K7 (519-679-2111) has 15,269 full-time and 3,164 part-time undergraduates, 1,843 full-time and 199 part-time graduate students. Its major faculties and professional schools are: *Faculties*: Applied Health Sciences, Arts, Dentistry, Education, Engineering Sciences, Graduate Studies, Law, Medicine, Music, Nursing, Part-time and Continuing Education, Science, Social Science.

Professional Schools: Business Administration, Library and Information Sciences, Journalism.

Affiliated Colleges: Brescia College, Huron College, Kings College.

Organization of Northern Studies

Northern Research Committee
Chairman: Dr. Roger King
Associate Professor
Department of Geography
Tel.: (519) 679-3427

The UWO Northern Research Committee, which was established in 1972, reports directly to the President. It is responsible for the administration of the Indian and Northern Affairs Canada Northern Scientific Training Program grant, and its chairman is the UWO delegate to ACUNS.

Selected northern courses:

(all courses are at the undergraduate level)

a) *The Opening of the Canadian North*, Department of History (HIST 442E) (subarctic and arctic regions of Canada, period from 1914 to present)

b) *Canadian Native Cultures*, Department of Anthropology (ANTHRO 110E) (general survey of the heritage of various native peoples)

c) *Geography of Arctic Canada*, Department of Geography (GEOG 124b) (introduction to the landscapes of the Canadian Arctic)

d) *The Natural Environment*, Department of Geography (GEOG 123a) (characteristics and origin of selected natural environments)

e) *Geomorphology of Arctic and Alpine Environments*, Department of Geography (GEOG 312)

f) *Surficial, Glacial and Quaternary Geology*, Department of Geology (GEOL 467)

g) *Principles of Synecology*, Department of Zoology (BIOL 345a) (integrative approach to ecology, aquatic ecosystems)

h) *Topics in Applied Ecology*, Department of Zoology (BIOL 346b) (application of ecological principles to the management of fish and wildlife)

i) *Human Problems in International Management*, Business Administration (BUS 408)

Teaching in the North:

i) Northern Outreach Program
Director: Dr. Bruce Castleman (519) 679-3788

This program is coordinated by faculty in the various department of health sciences on campus. The program is funded by the Ontario Ministry of Health and has been operating for five years. The area of operation extends to the northern border of Ontario. The objectives of the program are: a) to develop medical services in Northern Ontario; b) to provide professional development opportunities in northern centres; c) to contribute to research in the areas of supplies and services and manpower training; and d) to provide opportunities for students to work in northern areas (providing exposure to the culture) and provide northern workers with contact to southern institutions. This will hopefully encourage students to return to the north after graduation. Students from throughout Ontario are eligible for this program.

ii) Occasional use is made by faculty and students of the Churchill Northern Studies Centre and the facilities at the Arctic Institute of North America's base camp on Devon Island, NWT.

Distance Education:

Correspondence courses are available in the following areas: Administrative Studies, Biology, Economics, English, French, Geography, Geology, German, History, Mathematics, Nursing, Philosophy, Political Science, Psychology, Sociology, Statistics, Writing.

Contact: Office of Part-time and Continuing Education
Room 23, Stevenson-Lawson Building
University of Western Ontario
Tel.: (519) 679-3631

Co-op programs and special credit arrangements:

Students registered at other universities may request permission to take courses at Western for transfer of credit toward their degree program at their home university.

Northern research:

The following faculty are working on projects involving northern Canada and funded by NSERC:

Professors P.A. Forsyth, J.A. Fulford, G.F. Lyon, J.W. MacDougall, Department of Physics, "Radio Studies of Upper Atmosphere"

Professor C.D. Ankney, Department of Zoology, "Ecological Energetics and Feeding Ecology of Bird/Sex ratio, egg sequence and egg weight of Snow Geese"

Professor A.C. Lenz, Department of Geology, "Paleontology, Biostratigraphy, and Paleoecology of Lower Paleozoic of Northern and Arctic Canada" (funding pending)

Professor R.H. King, Department of Geography, "Mineralogy, geochemistry and variability of soil components" (funding pending)

Northern specialists

Dr. D.M. Ankney, Dept. of Zoology, Avian Ecology, Hudson Bay
Dr. R.W. Butler, Dept. of Geography, Recreation Geography, NWT
Dr. L.S. Carey, Dept. of Diagnostic Radiology, Preventative Medicine, Hudson Bay
Dr. J.R. Cartwright, Dept. of Political Science, Political Science, NWT
Dr. C. Creider, Dept. of Anthropology, Languages, Arctic in General
Dr. J.P. Denny, Dept. of Psychology, Inuit Languages, Hudson Bay
Dr. P.A. Forsyth, Dept. of Physics, Meteorology, Arctic in General
Dr. J.A. Fulford, Dept. of Physics, Meteorology, Arctic in General
Dr. M.B. Green, Dept. of Geography, Economic Geography, NWT, Yukon
Dr. L. Guemple, Dept. of Anthropology, Health Provision, NWT
Dr. J.F. Hart, Dept. of Computer Sciences, Satellite Communications, Arctic in General
Dr. R.W. Hodder, Dept. of Geology, Mineral Deposits Geology and Volcanology, Arctic in General
Dr. R.H. King, Dept. of Geography, Physical Geography, Yukon and Arctic Archipelago
Dr. M.H.A. Keenleyside, Dept. of Zoology, Hudson Bay
Dr. H.A. Leeper Jr., Program in Communicative Disorders, Arctic in General
Dr. A.C. Lenz, Dept. of Geology, Paleontology, Arctic Archipelago
Dr. G.F. Lyon, Dept. of Physics, Meteorology, Arctic in General
Dr. J.W. MacDougall, Dept. of Physics, Meteorology, Arctic in General
Dr. M.A. Maun, Dept. of Plant Sciences, Plant Ecology, Foxe Basin
Dr. R.F. Mereu, Dept. of Geophysics, Arctic in General
Dr. J.S. Millar, Dept. of Zoology, Mammalogy, Arctic in General
Dr. L. Orloci, Dept. of Plant Sciences, Botany, Arctic in General
Prof. C.M. Pearce, Dept. of Geography, Physical Geography, Mackenzie Delta

Dr. M. Seguin, Dept. of Anthropology, Linguistics, Northern British Columbia
Dr. D.S. Simpson, Faculty of Education,. Teacher Training, Arctic in General
Dr. L.S. Valberg, Dept. of Medicine, Environmental Health, Hudson Bay
Dr. G.M. Young, Dept. of Geology, Sedimentology, Arctic Archipelago
Dr. R. Young, Dept. of Political Science, Yellowknife
Dr. M. Zaslow, Dept. of History, Arctic in General

Selected northern publications

Theses defended in the past three years with a northern focus:

Ph.D. Dissertations:

Banting, D.R., 1982, Characterization of Arctic Soils: Interrelationships with Site and Vegetation, Ph.D. dissertation, Department of Geography, Dr. R.H. King advisor.

Jefferson, C.W., 1983, The Upper Proterozoic Redstone Copper Belt, Mackenzie Mountains, Northwest Territories, Department of Geology, Ph.D. dissertation, Dr. G.M. Young advisor.

McCracken, A.D., 1985, Middle Ordivician to Silurian (Wenlock) Conclast Taxonomy and Biostratigraphy from Basinal Strata of the Road River Formation in the Richardson Mountain, Northwest Territories, Department of Geology, Ph.D. dissertation, Dr. A. Lenz advisor.

McGrath, R., 1983, Canadian Eskimo Literature — The Development of a Tradition, Department of English, Ph.D. dissertation, Dr. J. Reaney and Dr. W. Finlayson advisors.

Nixon, P.G., 1984, Eskimo Housing Programmes 1954-65. A Case Study of Representative Bureaucracy, Department of Political Science, Ph.D. dissertation, Dr. A.R. McDougall advisor.

M.A./M.Sc. Theses:

Averack, L., 1983, Parent Material Uniformity and Clay Mineral Alteration in Five Soils from the Southwest Yukon Territory, M.Sc. thesis, Department of Geography, Dr. R.H. King advisor.

McDermott, P.T., 1985, Economic and Employment Training Programs in the N.W.T., M.A. thesis, Department of Political Science, Dr. R. Young advisor.

Murray, F.H., 1984, Geochemical Trends in Lignite Bearing Cretaceous Sediments from the Mattagami Formation (James Bay Lowlands), M.Sc. thesis, Department of Geology, Dr. W.S. Fyfe and Dr. B. Kronberg advisors.

Robertson, W.S., 1983, Canada's Commitment to NATO's Northern Flank. The Northern Base Option, M.A. thesis, Department of Political Science, Prof. W.M. Dobell advisor.

Native Studies

Museum of Indian Archaeology
Lawson-Jury Building
1600 Attawandaron Road
London, Ontario N6G 3M6
Telephone: (519) 473-1360
Dr. William D. Finlayson, Director

Centre for Research and Teaching of Canadian Native Languages
Social Science Centre, Room 3408
University of Western Ontario
London, Ontario
Telephone: (519) 679-6880
Dr. Margaret Seguin, Director

UNIVERSITY OF WINDSOR
WINDSOR, ONTARIO

General information

ADDRESS: University of Windsor, 401 Sunset Avenue, Windsor, Ontario, N9B 3P4, (519-253-4232).

LOCATION: The University of Windsor is located in extreme southwestern Ontario and in the centre of the Great Lakes region. The campus is situated in the northwest part of the city of Windsor, overlooking the Detroit River.

ENROLLMENT: In the Winter of 1985, undergraduate enrollment stood at 7234 full-time and 3793 part-time, and graduate enrollment was 512 full-time and 349 part-time.

FACULTIES AND SCHOOLS: The Faculties of the University include Arts, Science, Social Science, Business Administration, Education, Engineering, Human Kinetics, Law, and Graduate Studies. There are three professional schools: Nursing, Social Work, and Visual Arts, and several research institutes, including the Great Lakes Institute. Master's degrees are offered in thirty-two disciplines and Doctorate's in ten.

Organization of Northern Studies

There is no institute of formal administrative structure concerned with northern studies, nor are there any degree programs specifically directed toward northern interests. Rather, students with northern interests pursue their studies within the regular academic framework under the direction of particular faculty members who are involved in the north. The northern activities within the University are loosely coordinated by the Northern Studies Group, currently chaired by Dr. J.D. Jacobs, Department of Geography (519-253-4232 ext. 2177/2171).

Northern courses

Although a number of courses have significant northern content, particularly in Anthropology, Biology, Geography, and Geology, specifically northern courses are limited to the following: Geography 42-219, The Arctic Environment (an interdisciplinary field course); Geography 42-360, The Canadian Arctic (concerned with the physical and cultural geography of the region); and Anthropology 49-230, Northern Canada (concerned with

(Crustacea, Cladocera) in the Canadian Arctic. Can. J. of Zool.

Ferrari, D.C. and P.D.N. Hebert, 1982. The induction of sexual reproduction in *Daphnia magna:* genetic differences between arctic and temperate populations. Can. J. Zool. 60: 2143-2148.

Hebert, P.D.N., in press. Genotypic characteristics of Cladocera. Hydrobiologica.

Hebert, P.D.N. and W.J. Payne, 1985. Genetic variation in populations of the hemaphroditic flatworm *Mesostoma lingua* (Turbellarria, Rhabdocoela). Biol. Bull. 169:143-151.

Hebert, P.D.N. and J.M. Loaring, in press. Systematics of the *D. pulex* complex: morphological variation in an agamic complex and description of a species new to North America. Biochem. Syst. and Ecology.

Hebert, P.D.N., in press. Patterns in the diversity of arctic zooplankton communities. Can. J. Fish. Aquatic Sci.

Hebert, P.D.N., 1985. Ecology of the dominant copepod species at a low arctic site. Can. J. Zool. 63:1138-1147.

Hebert, P.D.N., 1984. Demographic implications of genotypic diversity in zooplankton populations. pp. 195-207 in K. Wohrmann and V. Loeschke, eds. Population Biology and Evolution, Berlin: Springer Verlag.

Hebert, P.D.N. and J.M. Loaring, 1980. Selective predation and the species composition of arctic ponds. Can. J. Zool. 58:422-426.

Jacobs, J.D., W.N. Mode, C.A. Squires, and G.H. Miller, in press. Holocene environments of the Frobisher Bay area, Baffin Island, N.W.T.: Deglaciation, emergence, and the sequence of vegetation and climate. Geog. phys. Quat. 39 (2).

Jacobs, J.D., and D.R. Stenton, in press. Environment, resources and prehistoric settlement in upper Frobisher Bay, Baffin Island. Arctic Anthro.

Jacobs, J.D., W.N. Mode, and E.K. Dowdeswell, 1985. Contemporary pollen deposition and the distribution of *Betula glandulosa* at the limit of low arctic tundra in southern Baffin Island, N.W.T. Arct. Alp. Res. 17(3):279-287.

Jacobs, J.D., J.T. Andrews and S. Funder, 1985. Chap. 2 Environmental background; and J.D. Jacobs, 1985, Chap. 25. Environment and Prehistory, Baffin Island, in J.T. Andrews, ed., Quaternary Environments: Eastern Canadian Arctic, Baffin Bay and West Greenland. Boston: Allen and Unwin.

Jacobs, J.D. and M.E. Sanderson, 1984. Toward university education in the North. Northline 4(1): 2.

M'Closkey, K.A. in press. The impact of the art/craft distinction on work produced by non-western people. Culture.

Paraschak, Victoria, 1985. A look at government's role in N.W.T. Recreation. Occasional Paper No. 1, Prince of Wales Northern Heritage Centre, Yellowknife, pp. 11-27.

Sabo, G. III, and J.D. Jacobs, 1980. Aspects of Thule Culture adaptations in southern Baffin Island. Arctic 33: 487-504.

Schwartz, S.S. and P.D.N. Hebert, in press. Prey preference and utilization by *Mesostoma lingua* (Turbellaria, Rhabdocoela) in the Canadian subarctic. Hydrobiologica.

Short, S.K. and J.D. Jacobs, 1982. A 1100 year paleoclimatic record from Burton Bay - Tarr Inlet, Baffin Island. Can .J. Earth Sci. 19(3): 398-409.

Native Studies

There is a small group of faculty members and students at the University of Windsor who are actively involved in Native Studies. The principal focus is cooperative arrangements with Indian bands in the southwestern Ontario region, including environment and resources management, social work, oral and archival history, community health, education, and legal aid. Occasionally there have been interactions on problems of common interest with northern Native groups, and there is a willingness on the part of University members to further such relationships. Such contacts are invited through the Northern Studies Group.

northern indigenous peoples). All of these courses are at the undergraduate level. Course credit is granted at both graduate and undergraduate levels in several departments for directed readings and research, which may include northern topics. Some three to five graduate degrees are granted annually on northern topics.

Teaching in the North

From time to time, beginning in the summer of 1977, the University of Windsor has offered a field course at a northern location — both Frobisher Bay and Igloolik have been used. The course is taught jointly by geographers, biologists and geologists, with contributions by Inuit elders. It is intended to accommodate students from both the northern communities and the south, and in the early years had roughly equal numbers of each. Although the course was last taught in 1982, it could be offered again, given sufficient demand from northern residents and some support from northern educators.

At present, some 15 to 20 students from the University of Windsor regularly do field work in the Arctic during the summer. For some undergraduates, this includes directed studies for which the students receive academic credit.

Distance Education

For the past three years, the University of Windsor has been offering credit courses by non-traditional means so that students who are unable to attend regular classes may enrol for courses. Students at some distance from the University have been able to complete credits toward their degree. Distance Education courses include a textbook, study guide, and other print materials, and may also include videotape or audio programs, and discussions in person, by telephone, or by teleconferencing. The University of Windsor plans to extend these offerings where possible to as many students as wish to study by Distance Education means. Courses from various Faculties are offered by Distance Education. Interested students may contact the Office of Part-Time Studies at the University of Windsor for further information.

Northern research

Major research is being conducted in three problem areas at the present time. Dr. P.D.N. Hebert (Biology) has been involved in studies of the population biology and genetics of invertebrates in tundra ponds in the vicinity of Churchill, Manitoba for a number of years. This research, which is being extended to the High Arctic, currently is focussed on the following projects: 1. Clonal diversity patterns in obligate parthenogens, with *Daphnia pulex* as the species of interest, 2. Stock discrimination based on divergence in the mitochondrial genome — aimed at differentiating fish stocks, and 3. Comprehensive study of an assembly of zooplankton communities at a low arctic site — a continuation of the work at Churchill.

Dr. J.D. Jacobs (Geography) is involved in a long-term study of paleoenvironments and climate change in southern Baffin Island. This has involved subregional and mesoscale studies of climate, sea-ice, and vegetation, as well as productive collaboration with archaeologists on problems of climate-culture change in the region. Current research is aimed at mapping the past and present extent of low arctic habitat in the region, with implications for changes in terrestrial production over time and applications in resources management.

Dr. I.M. Weis (Biology) has undertaken a study of the ecology of the dwarf birch, *Betula glandulosa*, in southern Baffin Island. A principal objective in this study is an understanding of conditions affecting reproduction and migration of birch at the northern limit of its distribution. In addition to the intrinsic value of the study, it has considerable potential value to biogeographers and paleobotanists who have used this species as a climate-sensitive indicator of low arctic conditions.

A number of other short-term projects have been conducted by faculty and students as well, most of these in southern Baffin Island. These include precipitation chemistry and impacts of long-range transports of atmospheric pollutants on tundra ponds and lakes, geochemical studies of runoff in a permafrost environment, a study of aggregate sources and concrete in the Frobisher Bay area, a comparative study of the arts-crafts distinction between Inuit and Navajo, and a study of Inuit and Dene communication societies in the N.W.T.

Funding of this research is from a variety of sources, but principally the Natural Sciences and Engineering Research Council and the Department of Indian and Northern Affairs, through the Northern Scientific Training Program, which supports the fieldwork of some 12-15 students per year.

The University of Windsor does not have its own field station, but maintains a good working relationship with the Ikaluit Laboratory (DINA) at Frobisher Bay, which provides essential logistical support to field parties.

Northern specialists

Hebert, Paul D.N., Professor, Department of Biology. (519-253-4232, ext. 2709).

Hedley, Max J., Associate Professor, Department of Sociology and Anthropology. (519-253-4232, ext. 2205).

Hudec, Peter P., Professor, Department of Geology and Department of Geological Engineering. (519-253-4232, ext. 2491).

Jacobs, John D., Associate Professor, Department of Geography. (519-253-4232, ext. 2177).

Sanderson, Marie E., Professor, Department of Geography. (519-253-4232, ext. 2181).

Sklash, Michael G., Associate Professor, Department of Geology and Department of Geological Engineering. (519-253-4232, ext. 2496).

Paraschak, Victoria, Assistant Professor, Faculty of Human Kinetics. (519-253-4232, ext. 2435).

Weis, I. Michael, Associate Professor, Department of Biology. (519-253-4232, ext. 2724).

Selected northern publications

Barker, D.M. and P.D.N. Hebert, (in press). Secondary sex ratio of the cyclic parthenogen *Daphnia magna*

Association of Canadian Universities for Northern Studies
Association universitaire canadienne d'Études nordiques

The Association represents thirty-five Canadian universities active in northern studies, research and training. Founded at Churchill, Manitoba in 1977, it is a federally incorporated charitable organization.

The purpose of the Association is the advancement of northern scholarship through education, professional and scientific training and research.

L'Association représente trente-cinq universités canadiennes actives dans le domaine des études, de la recherche et de la formation sur le Nord. Fondée à Churchill, Manitoba en 1977, c'est une organisation charitable, à but non lucratif et incorporée.

L'objectif de l'Association est l'avancement de l'érudition nordique, grâce à l'éducation, la formation professionnelle et scientifique, et la recherche.

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